

FINDING ORDER WITHIN THE CHAOS OF COUNTERNARCOTICS: A UNIVERSAL
FRAMEWORK FOR THE REDUCTION OF ILLICIT CROP CULTIVATION

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Art of War Scholars

by

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ABSTRACT

FINDING ORDER WITHIN THE CHAOS OF COUNTERNARCOTICS: A UNIVERSAL FRAMEWORK FOR THE REDUCTION OF ILLICIT CROP CULTIVATION, by Major Nicholas B. Challen, 101 pages.

This thesis proves the existence of a universal framework that can be used to strategically reduce illicit crop cultivation in source countries. This framework is established through the demonstration of four universal principles: counternarcotics strategies require multiple coordinated components; counternarcotics strategies must lead with state presence and security; eradication reduces illicit crop cultivation when applied with sufficient threat; and alternative development must be applied in the right sequence, leading with human resources development, local participation, and investment in infrastructure. The concept of determining a limit to farmers' tolerance of eradication in order to provide a sufficient threat of eradication is a novel concept presented in this paper, with sufficient threat of eradication ultimately causing a reduction in illicit crops planted each year. This thesis does not assume to have determined all of the universal counternarcotics principles. As more principles are discovered through additional studies, the current framework will continue to be developed and refined, increasing its ability to strategically reduce the cultivation of illicit crops.

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TABLE OF CONTENTS

	Page
MASTER OF MILITARY ART AND SCIENCE THESIS APPROVAL PAGE	iii
ABSTRACT.....	iv
ACKNOWLEDGMENTS	v
TABLE OF CONTENTS.....	vi
ACRONYMS.....	viii
ILLUSTRATIONS	ix
TABLES	x
CHAPTER 1 INTRODUCTION	1
Purpose.....	1
Problem	1
Reducing Illicit Crop Cultivation	3
Counternarcotics Components	6
Primary Research Question	8
Secondary Research Questions	8
Significance of the Study	8
Limitations	9
Scope and Delimitations	10
CHAPTER 2 LITERATURE REVIEW	11
Commonalties and Gaps in Literature	11
Alternative Development	15
Global Perspective of Alternative Development	15
Alternative Development Case Studies on Individual Countries	18
Conditionality	21
Eradication	22
Multi-Component Comparisons	27
Annual Reports	28
Performance Measures.....	29
CHAPTER 3 RESEARCH METHODOLOGY	32

Systematic Approach	32
Quantitative Research Methods	32
Qualitative Research Methods	33
CHAPTER 4 ANALYSIS	35
The Balloon Effect.....	36
The Sustainable Effects of Counternarcotics Strategy.....	39
The Global Reduction of Illicit Cultivation	41
State Presence and Security	43
Eradication	45
The Limit to Farmers' Tolerance of Eradication	49
Colombia.....	49
Peru	53
Thailand	55
Econometric Analyses of Eradication.....	57
The Level of Threat during the Econometric Studies	59
Alternative Development.....	60
Overall Effectiveness of Alternative Development	60
Sequencing of Alternative Development	63
A Coordinated Approach	66
Conclusion of Analysis	68
CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS	71
The Balloon Effect.....	71
Principles of a Counternarcotics Strategy.....	74
A Universal Framework for a Cost-Effective Counternarcotics Strategy	77
Performance Measures.....	80
Areas for Additional Research.....	82
Conclusion	83
GLOSSARY	86
BIBLIOGRAPHY	87

ACRONYMS

DTO	Drug Trafficking Organization
EC	Eradicated Crops
HIC	Harvested Illicit Crops
LIM	Limit to the Tolerance of Eradication
ToE	Threat of Eradication
TPIC	Total Planted Illicit Crops
UNDCP	United Nations Drug Control Programme (precursor to UNODC)
UNODC	United Nations Office on Drugs and Crime
US	United States
USAID	United States Agency for International Development

ILLUSTRATIONS

	Page
Figure 1. Coca Cultivation in South America	37
Figure 2. Opium Poppy Cultivation in Thailand.....	40
Figure 3. Opium Cultivation in South East Asia.....	41
Figure 4. Global Cultivation of Illicit Narcotics	42
Figure 5. Estimated Potential Production of Illicit Narcotics	43
Figure 6. Changes in TPIC versus ToE with Trendline	50
Figure 7. Change in TPIC versus ToE (Guaviare, Colombia)	51
Figure 8. Change in TPIC versus ToE (Caquetá, Colombia).....	52
Figure 9. Change in TPIC versus ToE (Norte de Santander, Colombia)	52
Figure 10. Change in TPIC versus ToE (Putumayo, Colombia).....	53
Figure 11. Change in TPIC versus ToE (Huánuco, Peru)	54
Figure 12. Change in TPIC versus ToE (San Martín, Peru).....	54
Figure 13. Change in TPIC versus ToE (Ucayali, Peru)	55
Figure 14. Change in TPIC versus ToE (Thailand).....	56

TABLES

	Page
Table 1. Effect of Eradication, Security, and Alternative Development on Coca Cultivation in Colombian Departments	45
Table 2. Eradication Terms	47
Table 3. Comparison of Econometric Studies on Illicit Cultivation and Eradication....	58
Table 4. EC to HIC relationships due to ToE to LIM comparisons.....	59
Table 5. The Impact of United Nations Socioeconomic Development Efforts in Areas of Illicit Cultivation, A Global Summary	61
Table 6. Area under illicit cultivation covered by UNDCP projects	62

CHAPTER 1

INTRODUCTION

Purpose

The purpose of this thesis is to prove the existence of and define a universal framework that can be used for the strategic reduction of illicit crop cultivation in source countries.

Problem

The literature on multi-country comparisons of various counternarcotics components and their applications is inadequate. The majority of existing studies examine one component in one country, one component in multiple countries, or multiple components in one country. Some examples of these types of studies are: “An Econometric Analysis of Coca Eradication Policy in Colombia,” *Alternative Development: A Global Thematic Evaluation*, and *Assessment of the Implementation of the United States Government’s Support for Plan Colombia’s Illicit Crop Reduction Components*.¹ Few examine a systematic application of multiple counternarcotics components to be used in all countries, possibly because of the perceived complexity in the task.

¹Ali Unlu and Alican Kapti, “Failed Alternative Development Programs: An Implementation Analysis of Coca Supply-Reduction Programs in Bolivia,” *International Journal of Public Policy* 8, no. 1 (2012): 160-179; United Nations Office on Drugs and Crime, *Alternative Development: A Global Thematic Evaluation* (New York: United Nations, 2005); Vanda Felbab-Brown, Joel M. Jutkowitz, Sergio Rivas, Ricardo Rocha, James T. Smith, Manuel Supervielle, and Cynthia Watson, *Assessment of the Implementation of the United States Government’s Support for Plan Colombia’s Illicit Crop Reduction Components* (Washington, DC: Management Systems International, 2009).

The United States (US) Government, for example, designates a significant portion of its foreign policy budget to attempting to control the flow of illicit narcotics. The *Fiscal Year 2013 Budget and Performance Summary for the National Drug Control Strategy* requested \$2 billion for international support.² It is clear that the US is currently committed to pursuing counternarcotics foreign policy and supply-side reductions. However, upon a broad literature review, it is also clear that there is very little academic research available on a universal framework for counternarcotics strategies that reduce illicit crop cultivation. The US General Accounting Office concluded in 2012 that there was no single US counternarcotics strategy to target source countries.³ While one single strategy may not be feasible, this thesis intends to show that a universal framework does exist which can be used to strategically reduce the cultivation of illicit crops in a cost effective manner.

Chapter 1 outlines the purpose and significance of this thesis as well as the problems it addresses. It includes the primary and secondary research questions, limitations, and the scope of the thesis. Chapter 2 provides a broad literature review of counternarcotics literature focused on the reduction of illicit crop cultivation. Chapter 3 presents the methodology used to prove or disprove the existence of a universal framework. Chapter 4 analyzes available qualitative and quantitative data in order to

²Executive Office of the President of the United States, *Fiscal Year 2013 Budget and Performance Summary for the National Drug Control Strategy*, 2012, http://www.whitehouse.gov/sites/default/files/ondcp/fy2013_drug_control_budget_and_performance_summary.pdf (accessed April 9, 2013).

³United States General Accounting Office, *Counternarcotics Assistance: U.S. Agencies Have Allotted Billions in Andean Countries, but DOD Should Improve Its Reporting of Results* (Washington, DC: United States General Accounting Office, 2012), 7.

answer the secondary research questions. Finally, chapter 5 describes and integrates the trends found in chapter 4. It answers the primary research question by establishing the existence of a universal framework through universal counternarcotics principles. It determines an ordered approach to the reduction of illicit crop cultivation and recommends areas for further research.

Reducing Illicit Crop Cultivation

There are two ways to reduce illicit crop cultivation: stop crops from being planted or destroy them after they have been planted but before they are harvested. The process of destroying illicit crops is simple—either spray them with an herbicide, pull up the bushes from the ground in the case of coca, or chop off the stalks and plow the field in the case of opium poppy. Stopping illicit crops from being planted is more complicated; a government needs to induce conditions that motivate farmers to avoid the process altogether.

The motivations for a farmer are typically self-preservation and a decent quality of life.⁴ Farmers will generally perform a risk versus reward calculation prior to planting illicit crops.⁵ There are a variety of factors affecting the decision to grow illicit crops: some are purely agricultural, some are determined by the government or drug trafficking organizations (DTOs), and some are societal. In the end, a farmer typically defaults to whatever course of action will provide the best chance of survival.

⁴Jon Hellin, “Coca Eradication in the Andes: Lessons from Bolivia,” *Capitalism, Nature, Socialism* 12, no. 1 (2001): 139-57.

⁵Gary S. Becker, “Crime and Punishment: An Economic Approach,” *Journal of Political Economy* 76, no. 2 (1968): 169-217.

An individual can be convinced that the best financial opportunity lies in growing illicit narcotic crops for many reasons: the price farmers can sell illicit crops as compared to alternative crops, the historically reliable demand of narcotics, and the support provided by DTOs. Illicit crops tend to fetch higher prices than alternative crops and are generally easier to cultivate.⁶ In areas that support narco-trafficking, the market for illicit crops is generally more reliable than most alternative crops.⁷ Also, farmers in many areas do not need to worry about transporting the drugs to a market; DTOs will actually pick up the crops from the field and can pay in cash.⁸ DTOs have also been known to finance initial startup costs for farmers. Farmers do not get rich through growing narcotics, but in many cases, growing coca or opium gives them a better chance at surviving. Survival is a significant reward.

The public image of a government and its message on illicit crops will also have an effect on the farmer's decision-making process. While governments cannot reduce the rewards of cultivating illicit crops, they can encourage and enable alternative crop growth. In doing so, they help raise the rewards and reduce the risks of cultivating alternative crops. There are several elements which factor into this equation: the durability of the alternative crop, the ability of a farmer to transport that crop to a reliable

⁶Graham Farrell, "A Global Empirical Review of Drug Crop Eradication and United Nations' Crop Substitution and Alternative Development Strategies," *Journal of Drug Issues* 28, no. 2 (Spring 1998): 408.

⁷Francisco E. Thoumi, *Illegal Drugs, Economy, and Society in the Andes* (Washington, DC: Woodrow Wilson Center Press, 2003), 355.

⁸Robert Filippone, "The Medellin Cartel: Why We Can't Win the Drug War," *Studies in Conflict and Terrorism* 17, no. 4 (1994): 323-344.

market, and the profit a farmer can make from that crop.⁹ All of these factors are weighed in a farmer's decision to plant something other than coca. Beyond the rewards of cultivating illicit crops, a farmer must consider the risks: sanctions, eradication, and drug-related violence. Governments can increase the risk of planting illicit crops by imposing sanctions against those that do. They can also enforce eradication. Whether aerial or manual, eradication reduces the amount of crops that make it to harvest. Additionally, the violence associated with DTOs is another risk that farmers incur when planting illicit crops.¹⁰ Conversely, a risk of not planting illicit crops can be harassment by DTOs. To neutralize this risk, governments must effectively negate this pressure coming from DTOs.

Social pressure can either influence farmers to grow illicit crops or avoid them. In addition to the pressures that a government and DTO can contribute, the opinions of neighbors, friends, and family will all weigh on a farmer's mind. Community networks cannot only affect the farmer's conscience, but they can act as the eyes and ears of either the government or the DTOs. Acknowledgement of social pressures can redirect the focus of alternative development from the individual farmer to a farming community.

Thus, a farmer analyzes a complex set of factors when deciding whether or not to partake in illegal crop cultivation. Unfortunately, there is insufficient data, quantitative or qualitative, to analyze all of these dynamics. Instead, this thesis will focus on areas with

⁹Connie Veillette and Carolina Navarrete-Frias, *Drug Crop Eradication and Alternative Development in the Andes* (Washington, DC: Congressional Research Service, 2005), 21.

¹⁰Executive Office of the President of the United States, *National Drug Control Strategy*, 2012, http://www.whitehouse.gov/sites/default/files/ondcp/2012_ndcs.pdf (accessed April 9, 2013).

sufficient evidence to determine if universal trends exist within the factors that affect farmers.

Counternarcotics Components

Counternarcotics components influence farmers in different ways. The US government currently uses a three-pronged approach involving interdiction, eradication, and alternative development. Interdiction, however, targets DTOs and not farmers. Thus, this thesis examines state presence and security, precursors to a successful interdiction effort, as a third component. While eradication and alternative development directly affect the farmer, government presence and security can have direct and indirect effects.

Eradication raises the risks of planting illicit crops by threatening to destroy them before they can be harvested. The two methods for eradication are manual and aerial. Manual eradication involves physically pulling up the plant. Aerial eradication involves spraying the crops with chemicals from overhead. While aerial eradication is always considered forced, manual eradication can either be forced or voluntary. Voluntary eradication occurs when farmers sign agreements to destroy their own crops, usually in exchange for development aid.

Aerial eradication may be preferable to manual eradication in areas where it is very costly to reach the fields by ground. In some areas, farmers or DTOs will use blockades, ambushes, or mines to dissuade the government from eradication.¹¹ Aerial eradication avoids those issues, though a plane can also be targeted. The biggest

¹¹Executive Office of the President of the United States, *National Drug Control Strategy*, 2012, http://www.whitehouse.gov/sites/default/files/ondcp/2012_ndcs.pdf (accessed April 9, 2013).

disadvantage of aerial eradication is its negative environmental impact and the possibilities of spraying farmers in the fields.

While eradication raises the risks of growing illicit crops, alternative development reduces the risks through the planting of alternative crops. Components of an alternative development program can include human resources development, local community participation, infrastructure development, transportation service, seed subsidies, and credit programs. Effective alternative development must be tailored to the community and should be focused on long-term goals versus short-term gains.¹²

Government presence and security influence a farmer in three areas. First, farmers will be inherently more aligned with a government that provides representation and basic needs. Second, a farmer's ability to work outside of the rules and regulations established by a government are reduced as government presence and security are increased. And last, stronger government presence and security reduce the influence that DTOs have on farmers.

This thesis uses qualitative and quantitative data from literature to determine trends within the application of government presence and security, eradication, and alternative development that provide universal counternarcotics principles. Illicit crop cultivation data from different countries is then analyzed to identify any additional trends. The presence of multiple universal counternarcotics principles will establish the existence of a universal framework.

¹²USAID/Peru, *A Comparative Analysis of USG Alternative Development Programs* (Lima: USAID/Peru, 2011), 2.

Primary Research Question

Is there evidence to support the existence of a universal framework that can be used to strategically reduce illicit crop cultivation in source countries?

Secondary Research Questions

1. Are there trends within qualitative and quantitative data found in academic literature that establish universal counternarcotics principles that reduce the cultivation of illicit crops?
2. Are there trends in available illicit crop cultivation data that establish universal counternarcotics principles that reduce the cultivation of illicit crops?
3. Are there gaps in available data that could establish trends within counternarcotics strategies that reduce the cultivation of illicit crops?

Significance of the Study

Effective counternarcotics strategies are important for two reasons: they reduce instability and they reduce the supply of illicit drugs available for transport.¹³ Reducing instability in source countries reduces the safe havens for terrorist and criminal networks. Narco-trafficking provides financial support for these organizations as well.¹⁴ Thus, counternarcotics strategies reduce the sanctuary and livelihood of terrorist and criminal

¹³Liana Sun Wyler, *International Drug Control Policy: Background and U.S. Response* (Washington, DC: Congressional Research Services, 2012), 8.

¹⁴Frank Cilluffo, Deputy Director, Global Organized Crime Program Director, Counterterrorism Task Force. Testimony before the U.S. House Committee on the Judiciary-Subcommittee on Crime on The Threat Posed from the Convergence of Organized Crime, Drug Traffic, December 13, 2000, <http://csis.org/testimony/threat-posed-convergence-organized-crime-drug-trafficking-and-terrorism> (accessed September 18, 2013).

networks. Beyond terrorist and criminal networks, illicit drugs have a harmful effect on the health and welfare of society, threatening economic and social development.¹⁵

An examination of trends and commonalities within source countries could help prioritize counternarcotics components, and identify a framework that could be used in a cost effective reduction of illicit crop cultivation. Even if not all of the components of this framework can currently be defined, recognition that a cost effective framework exists would be a significant step forward, due to the amount of resources the world currently allocates to addressing this problem. Such a framework could be effectively used by source countries or countries with counternarcotics foreign policies. A cost-effective strategy is essential due to the size of the problem and the capital and time intensive requirements of its solution. Resources wasted on inefficiencies in one area reduce the ability to affect other areas. A universal framework can be used to strategically reduce the cultivation of illicit crops.

Limitations

The biggest limitation for this thesis is the availability of data. Performance measures for counternarcotics strategies have historically been improperly focused. Evidence of this can be found in the US General Accountability Office report titled *Counternarcotics Assistance: U.S. Agencies Have Allotted Billions in Andean Countries, but DOD Should Improve Its Reporting of Results*. Published in 2012, it identifies that the Department of State was still revising its performance measures due to a myopic focus on eradication and the Department of Defense had yet to submit reliable performance

¹⁵United Nations Office on Drugs and Crime, *World Drug Report: 2013* (New York: United Nations, 2013), Preface.

summary reports requested by the Office of National Drug Control Policy in 2007.¹⁶

Areas that lack useful empirical data will be limited to qualitative analysis. Research will also be limited to unclassified sources.

Scope and Delimitations

This thesis will focus on counternarcotics components that reduce the cultivation of illicit crops in source countries. The majority of research is conducted on state presence and security, eradication, and alternative development. These three areas are the primary components to the US's three-pronged approach to counternarcotics strategy and subsequently provide the most substantial evidence available to determine universal trends. This thesis will not discuss counternarcotics components that focus on areas outside of illicit crop cultivation, e.g. precursor control, judicial reform, and anti-money laundering. While those components are important to a holistic counternarcotics strategy, this thesis concentrates on components that target illicit crop cultivation. It will also avoid the discussion of the effectiveness of counternarcotics strategies that reduce demand versus reducing supply. While it is an important debate for counternarcotics policy, this thesis remains focused on what can be done to improve current supply reduction strategies.

¹⁶United States General Accounting Office, *Counternarcotics Assistance: U.S. Agencies Have Allotted Billions in Andean Countries, but DOD Should Improve Its Reporting of Results* (Washington, DC: United States General Accounting Office, 2012), 15-20.

CHAPTER 2

LITERATURE REVIEW

This chapter introduces works of academic literature that uniquely contribute to the discussion of a universal framework that can be used to strategically reduce illicit crop cultivation in source countries. It is divided into five sections. The first section identifies gaps and commonalities in all academic literature associated with this thesis. The next three sections cover literature that discusses alternative development, eradication, and multi-component comparisons. The final section examines performance measures used to evaluate counternarcotics efforts.

Commonalities and Gaps in Literature

Establishing commonalities and gaps within academic literature is essential to proving the existence of a universal framework. Commonalities in literature can provide evidence of universal principles; gaps identify areas that require further research. Throughout the vast amount of academic literature published on components of counternarcotics strategies, there are two commonalities and three gaps. One commonality is the premise of the “balloon effect,” a theory that predicts that the reduction of illicit crop cultivation in one area results in an increase in illicit crop cultivation elsewhere. The second commonality is the fact that counternarcotics strategies conducted in areas without state presence are ineffective. State presence, however, is rarely the central focus of academic literature, even though it is commonly used as a discussion point. This is one of the gaps in counternarcotics literature; there are few articles that examine state presence or security as their central theme. Another gap is in the comparisons of multiple

components of a counternarcotics strategy across multiple countries. The last gap is analysis that compares the performance of counternarcotics components across the three major areas for illicit crop cultivation: South America, South East Asia, and Afghanistan. Articles tend to focus their discussion on only one area. The only counternarcotics component that receives global consideration is alternative development.

One of the common reasons cited for the resiliency of illicit narcotics is the balloon effect, with the specific analogy to a balloon being credited to Wayne Bazant of the United Nations Office on Drugs and Crime (UNODC).¹⁷ It is the concept of counternarcotics efforts “squeezing” illicit crop cultivation from one area and pushing it into new areas under less “counternarcotics pressure.” The majority of arguments for the balloon effect are made by linking an area where counternarcotics efforts were successful to an area that has shown an increase in illicit drug cultivation over the same period of time. Charles Laffiteau uses the balloon effect to explain why supply-side strategies have not reduced the availability of illegal drugs in “The Balloon Effect: The Failure of Supply Side Strategies in the War on Drugs.”¹⁸

Stella M. Rouse and Moises Arce provide one of the few pieces of academic literature that empirically supports the balloon effect in “The Drug-Laden Balloon: U.S. Military Assistance and Coca Production in the Central Andes.” They examine variables of coca cultivation in neighboring countries: US military aid, cocaine seizures, gross

¹⁷Stella M. Rouse and Moises Arce, “The Drug-Laden Balloon: U.S. Military Assistance and Coca Production in the Central Andes,” *Social Science Quarterly* 87, no. 3 (2006): 542.

¹⁸Charles Laffiteau, “The Balloon Effect: The Failure of Supply Side Strategies in the War on Drugs,” *Academia. Edu* 1 (2011): 1-18.

domestic product per capita, the farm-gate price of an alternative crop, the farm-gate price of coca leaves, and rural density within Colombia, Bolivia, and Peru from 1980 to 2001. Multiple equations were solved to account for different correlation among the variables. The results support the premise that successful pressure to reduce illicit crop cultivation in one area results in expansion of illicit crop cultivation in other areas.¹⁹ There was a negative correlation between US military aid per capita and the amount of coca cultivation within that country. Also, the amount of coca cultivation in a given country showed a negative correlation with the amount of coca cultivation in neighboring countries.

In addition to the balloon effect, state presence is a common theme throughout counternarcotics literature. However, articles mention the lack of state presence as a cause for the failure of counternarcotics strategies more than the existence of state presence as a cause for success. This is true whether a paper is discussing alternative development, eradication, or a combination of counternarcotics components.

“Assessment of the Implementation of the United States Government’s Support for Plan Colombia’s Illicit Crop Reduction Components” by Vanda Felbab-Brown et al. and “The Role of Alternative Development in the ‘War on Drugs’: The Case of Bolivia” by Emily Phan-Gruber are examples of literature that describe the issues with weak state presence.

These two articles also provide examples for the gap in literature regarding state presence as well as security. The majority of information regarding state presence and security is found in articles assessing overall strategies or other components. Little, if any, is written with state presence or security as the central point for discussion.

¹⁹Rouse and Arce, 540-557.

There is also scarce academic literature comparing the application of multiple factors that reduce the cultivation of illicit crops in more than one country. Jonathan F. Catalano compares the effects of eradication, alternative development, and long-term security expansion on coca cultivation in “The Efficacy of Foreign Assistance in Counter Narcotics,” but attempts to isolate the initiatives instead of sequencing them. He also only focuses on Colombia. Felbab-Brown et al. discuss numerous different counternarcotics components as well, but is also only focused on Colombia in “Assessment of the Implementation of the United States Government’s Support for Plan Colombia’s Illicit Crop Reduction Components.” While the US General Accounting Office’s *Drug Control: Efforts to Develop Alternatives to Cultivating Illicit Crops in Colombia Have Made Little Progress and Face Serious Obstacles* examines multiple countries, it is focused solely on alternative development. The discussion on eradication and state presence is contained to their effects on alternate development.

The last notable gap in counternarcotics literature is in comparisons of counternarcotics strategies in South America, South East Asia, and Afghanistan. The United Nations produced three documents that capture lessons from alternative development in all three regions: *Alternative Development: A Global Thematic Evaluation, Sharing Experiences on Alternative Development*, and an internal paper titled “The Economic Viability of Alternative Development.” Graham Farrell’s “A Global Empirical Review of Drug Crop Eradication and United Nations’ Crop Substitution and Alternative Development Strategies” does the same. There is a little academic literature beyond these four pieces that provides a global perspective on counternarcotics components.

Alternative Development

The whole of counternarcotics literature can also be separated into categories by subject. The two most common are alternative development and eradication, with the majority of literature written about the former. Alternative development literature generally consists of case studies performed within one country, though as previously mentioned, there are four that take a global perspective. This section also includes one article and one report that focus on conditionality, or the linking of alternative development to eradication goals. Academic literature on alternative development generally includes one or more of the following conclusions: it is more sustainable than eradication; it benefits the population whether or not it successfully reduces illicit crop cultivation, and government presence is necessary for the success of alternative development. The majority of conclusions are based on qualitative evidence through general observations and experiences.

Global Perspective of Alternative Development

The majority of literature that offers a global perspective is produced by the UNODC. *Alternative Development: A Global Thematic Evaluation*, published by the UNODC in 2005, examines alternative development in South East Asia, the Andean region, and Afghanistan. It focuses on alternative development as human development and cultural change. It also explores the preconditions that fuel illicit crop cultivation, specifically poverty and inequality of lifestyle. The evaluation underscores that the primary factor causing Andean growers to cultivate coca is the lack of a viable, stable alternative. The primary emphasis is on the broad application of alternative development programs, primarily at the policy level. One point of significance, however, is that coca

reduction strategies with multiple counternarcotics initiatives have historically been poorly coordinated. It specifically states that “successful alternative development requires proper sequencing.”²⁰

Sharing Experiences on Alternative Development, published by the UNODC in 2009, is a compilation of counternarcotics strategies and experiences spanning Colombia, Peru, China, Laos, Myanmar, and Thailand. The intent of this document is to consolidate lessons learned from alternative development across the globe, including international efforts. Though the primary focus is not the specific application of alternative development programs, there are some broad guidelines that can be found throughout the document. Government presence and security are repeatedly stressed as prerequisites to alternative development. It also highlights the need for infrastructure and basic services as critical requirements of alternative development. Eradication is discussed in many of the illicit crop reduction strategies, though not specifically linked with alternative development. It does note, however, that eradication by itself is not sustainable, due to the fact that farmers simply replant in the same area or find a new area.²¹

Other than the UNODC, Farrell is the only author to provide a global perspective on alternative development. He is also one of the few authors who analyze its merits quantitatively. “A Global Empirical Review of Drug Crop Eradication and United Nations’ Crop Substitution and Alternative Development Strategies” uses a rigorous quantitative approach to review two decades of illicit crop reduction programs within 11

²⁰United Nations Office on Drugs and Crime, *Alternative Development*, 21.

²¹United Nations Office on Drugs and Crime, *Sharing Experiences on Alternative Development* (New York: United Nations, 2009), 250.

countries. It concludes that neither eradication nor alternative development have had any significant impact on the global availability of illicit narcotics. The study determines that alternative development can have a localized effect, but requires three prerequisites: effective government control of the area, law enforcement or eradication that disincentives illicit crop cultivation, and market forces that make illicit cultivation less attractive in the targeted area.²² It also reveals that eradication can lead to reductions in isolated areas, but that sustained eradication can actually lead to an increase in the overall area of coca cultivation. In addition to analytical analysis, the study provides one of the most comprehensive explanations of the processes of illicit cultivation, eradication, and alternative development in a single document.

“The Economic Viability of Alternative Development” is a United Nations Drug Control Programme (UNDCP) internal paper that was written in 1999, a year after “A Global Empirical Review of Drug Crop Eradication and United Nations’ Crop Substitution and Alternative Development Strategies” was published.²³ It provides a point by point negation of commonly held misconceptions about alternative development. For example, the paper illustrates how alternative crops can actually provide a higher profit than illicit crops. It is also very helpful in providing a global perspective on the small percentage of the area under illicit narcotics cultivation that had been targeted with alternative development in 1999, only approximately 10 percent.

²²Farrell, 429.

²³United Nations Drug Control Programme, “Economic Viability of Alternative Development,” 1999, http://www.unodc.org/pdf/Alternative%20Development/EconomicViability_AD.pdf (accessed August 13, 2013).

Alternative Development Case Studies on Individual Countries

As stated previously, however, the majority of alternative development focuses on case studies from individual countries as opposed to global summations. This thesis reviews three articles, two reports, and one book covering the countries of Colombia, Peru, Bolivia, and Thailand. These pieces provide both qualitative and quantitative data for analysis.

The US General Accounting Office compares the early alternative development efforts in Colombia to those in Peru and Bolivia in *Drug Control: Efforts to Develop Alternatives to Cultivating Illicit Crops in Colombia Have Made Little Progress and Face Serious Obstacles*. The most significant conclusion from this report is the requirement for government control in order for successful alternative development.²⁴ It also discusses the need for a comprehensive counternarcotics strategy involving multiple counternarcotics components applied over numerous years.

A detailed analysis of two decades of alternative development in Bolivia is captured by Phan-Gruber in “The Role of Alternative Development in the ‘War on Drugs’: The Case of Bolivia.” It provides detailed analysis of two decades of alternative development in a single country. While concluding that alternative development provides a possible long-term solution for the reduction of coca cultivation, she also states the

²⁴United States General Accounting Office, *Drug Control: Efforts to Develop Alternatives to Cultivating Illicit Crops in Colombia Have Made Little Progress and Face Serious Obstacles* (Washington, DC: United States General Accounting Office, 2002), 2.

need for continued efforts in eradication and interdiction.²⁵ Furthermore, Phan-Gruber stresses the need for government control in areas of either eradication or alternative development. In addition to recommendations for future strategies for illicit crop reduction, the article presents a detailed discussion of the evolution of alternative development within Bolivia.

Ali Unlu and Alican Kapti also analyze Bolivia's alternative development in "Failed Alternative Development Programs: An Implementation Analysis of Coca Supply-Reduction Programs in Bolivia." After examining the successes and failures of multiple programs, they conclude that successful alternative development programs are built around local communities through participation and existing community structures. Alternative development programs rely on individuals and leaders in the local community for program design and implementation.²⁶ A strong recommendation is then made for a focus on human resources development in the early stages of alternative development due to this local, participatory requirement. The requirement for human resources development is largely absent in most alternative development literature. The discussion of conditionality is another significant component of this article. It discusses the cost and benefits of the zero-coca requirements for alternative development, concluding that conditional requirements should be flexible.

Unlu's and Kapti's arguments on human resources development echo those made by Hagen Dirksen 10 years prior in "18 Years of the Thai-German Highland

²⁵Emily Phan-Gruber, "The Role of Alternative Development in the 'War on Drugs': The Case of Bolivia," *The Journal of Civil Society and Social Transformation* 1 (January 2010): 5.

²⁶Unlu and Kapti, 160-179.

Development Program—Has it been a Success Story?” Though Dirksen is writing about a completely different culture and crop than Unlu and Kapti, he too lists human resources development as the most important component, due to the necessity of human and institutional capabilities in long-term sustainable development. The other factors noted for the success found in Thailand are private sector involvement, infrastructure development, funding, political commitment, local empowerment, and a lengthy timeframe.²⁷

Another perspective on alternative development in Thailand is presented by Ronald D. Renard in *Opium Reduction in Thailand, 1970-2000: a Thirty Year Journey*. Instead of human resources development, Renard focuses more on the participatory nature of alternative development. He credits the success seen in Thailand to the evolution of alternative development, from simplistic crop replacement programs into a “broad balanced approach comprising demand reduction, participatory community development, and law enforcement.”²⁸ This evolution happened in three stages: crop replacement, rural integrated development, and then participatory alternative development. The book also credits Thailand’s success to strong national leadership, political will, national unity, and sound investments by the international community. While many discussions on alternative development touch upon the necessity for local participation within the planning and implementation phases, Renard makes it the central

²⁷Hagen Dirksen, “18 Years of the Thai-German Highland Development Program –Has it been a Success Story?,” *German Technical Co-operation (GTZ)* (2002) <http://www.gtz.de/de/dokumente/en-dirksen-02.pdf> (accessed September 14, 2009).

²⁸Ronald D. Renard, *Opium Reduction in Thailand, 1970-2000: A Thirty Year Journey* (Bangkok: Silkworm Books, 2001), xv.

theme of his book. It is also one of the most thorough accounts available for the reduction of opium within Thailand.

Last, the United States Agency for International Development (USAID)/Peru describes the alternative development strategy currently being applied within Peru in *Comparative Analysis of USG Alternative Development Programs*. The methodology used in Peru involves the typical US three-pronged approach involving interdiction, eradication, and alternative development, but exhibits an evolution in coordination and application. The report highlights the success of this methodology in the region of San Martín. Though primarily focused on alternative development, the report discusses the increased effects seen in eradication campaigns that maximize efforts on a limited area in order to ensure a high likelihood of eradication for the targeted farmers. It also states the need for conditionality, or the linking of alternative development with a “zero-illicit crop” policy, though it mentions a pilot program conducted in the Macarena region of Colombia that has lifted the 100 percent coca-free policy for a trial basis.²⁹

Conditionality

Conditionality is one of the largest debates for the implementation of alternative development. The US generally holds firm on the stance that a zero-illicit crops policy must complement alternative development. The rest of the world is more relaxed with this demand.

Alternative Development and Eradication: A Failed Balance is a debate paper written in 2002 that argues against conditionality. It states, “Alternative Development

²⁹USAID/Peru, 7.

should neither be made conditional on prior elimination of drug crop cultivation nor should a reduction be enforced until licit components of livelihood strategies have been sufficiently strengthened.”³⁰ It argues that reduction targets and deadlines lead to flawed policy. In many cases, development is required prior to eradication in order to ensure a farmer’s livelihood, and zero-illicit crop policies do not allow for a truly participatory approach to alternative development.

An argument for conditionality is made by Chemonics International Incorporated in their report, *Peru Alternative Development Program (PDA): Final Report*. However, instead of mandatory eradication, Chemonics illustrates the benefits of linking voluntary eradication to alternative development. With this policy, the Peru Alternative Development Program was able to exceed eradication targets. In areas that had previously undergone mandatory programmed eradication, resistance to the voluntary program was stronger, but eventually dissipated. However, the report is not just an argument for conditionality; it also emphasizes integrated development and the investment in education, health, infrastructure, and community development.³¹

Eradication

Beyond the discussion of linking eradication to alternative development, numerous articles focus on the subject of eradication by itself. While alternative

³⁰Amira Armenta, Martin Jelsma, Tom Blickman, Virginia Montañés, and Ricardo Vargas, *Alternative Development and Eradication: A Failed Balance* (Amsterdam: Transnational Institute, 2002), 4.

³¹Chemonics International Inc., *Peru Alternative Development Program (PDA): Final Report* (Washington, DC: United States Agency for International Development, 2008).

development literature is generally based on qualitative data, eradication literature commonly uses quantitative data to predict the effects of eradication on illicit crop cultivation. Colombia is one of the most commonly studied countries due to the significant amount of data available.

Rocia Moreno-Sanchez, David S. Kraybill, and Stanley R. Thompson predict economic drivers of coca cultivation in “An Econometric Analysis of Coca Eradication Policy in Colombia.” They use three different econometric models to analyze changes in the total area of coca cultivation. Each model uses a different equation that combines four variables: the area of coca cultivation in Colombia, the area of coca cultivation in Peru and Bolivia, farm-gate base price of coca leaves, and the area eradicated. The equations were derived using data from 1987 to 2001. All three models predict that farmers compensate for eradication by cultivating coca more extensively.³²

Other variables of interest in this econometric analysis are the farm-gate price of plantains and the area under coca cultivation in Bolivia and Peru. The negative relationship predicted by the analysis between the farm-gate price of plantains and coca cultivation suggests that crop substitution is more effective than eradication. Additionally, two of the models also predict a nearly 1:1 ratio of coca cultivation in other countries to coca cultivation in Colombia, suggesting that the reduction found in Peru and Bolivia was actually coca cultivation migrating into Colombia. This last relationship provides additional empirical analysis to support the balloon theory.

³²Rocio Moreno-Sanchez, David S. Kraybill, and Stanley R. Thompson, “An Econometric Analysis of Coca Eradication Policy in Colombia,” *World Development* 31, no. 2 (2003): 375-383.

Michelle L. Dion and Catherine Russler examine quantitative models to determine the relationships between coca cultivation and various factors in “Eradication Efforts, the State, Displacement and Poverty: Explaining Coca Cultivation in Colombia during Plan Colombia.” Their results predict that aerial eradication has virtually no direct effect on coca cultivation. Further statistical analysis within the study, however, was able to determine a direct relationship between aerial eradication and the emigration of displaced persons, which does directly reduce coca cultivation. Thus, eradication can indirectly reduce coca cultivation, though it does so through the displacement of coca farmers.³³ Additionally, immigration of displaced persons displays a positive relationship with coca cultivation, though to a significantly lesser effect than emigration.

Additional factors of significance are state presence, corruption, economic development, licit agriculture, market access, and poverty. The amount of coca cultivation is reduced in areas with increased state presence, while it rises in areas with increased corruption. While economic development lowers the amount of coca cultivation, licit agriculture actually increases the amount of coca cultivation. If licit agriculture is viewed as a determinant of the components necessary for agricultural growth, then logic predicts that coca would grow in departments that can support agriculture. Increased access to markets, though, significantly reduces coca cultivation. The last factor, poverty, actually exhibits a non-linear relationship with coca cultivation. Low levels and extremely high levels of poverty predict low levels of coca cultivation while moderate poverty predicts high levels of cultivation. Additionally, this study

³³Michelle L. Dion and Catherine Russler, “Eradication Efforts, the State, Displacement and Poverty: Explaining Coca Cultivation in Colombia during Plan Colombia,” *Journal of Latin American Studies* 40 (2008): 399-421.

provides insight into different quantitative performance measures that could be used in a holistic counternarcotics strategy. These will be discussed further in chapter 5.

Luis Carlos Reyes also attempts to determine the causal effect of eradication on coca cultivation in “Estimating the Causal Effect of Forced Eradication on Coca Cultivation in Colombian Municipalities.” He concludes that a one percent increase in eradication actually increases the area of coca cultivation by slightly less than one percent.³⁴ The analysis uses controls for regional and year fixed effects, municipality area, population density, legal crop cultivation, and number of combatants belonging to illegal armed groups. One unique feature of Reyes’ paper is its use of distance between eradication and fumigation base as a variable. Coca fields within 80 miles of a fumigation base, which subsequently faced a higher threat of eradication, were predicted to have a smaller resulting increase in coca cultivation due to eradication than those farther away, which faced a lower threat of eradication.

“Counterproductive Counternarcotic Strategies?” is the most recent econometric analysis performed on opium poppy cultivation in Afghanistan. It uses data from 2006 to 2010 in order to examine how eradication policies affect opium poppy cultivation considering two features: an imperfect credit market and share cropping. In both cases, the resulting equations supported that an increase in the threat of eradication leads to an increase in land under opium poppy cultivation.³⁵

³⁴Luis Carlos Reyes, “Estimating the Causal Effect of Forced Eradication on Coca Cultivation in Colombian Municipalities” (Master’s thesis, Michigan State University, 2011), 34.

³⁵Camilla I. M. Anderson, “Counterproductive Counternarcotic Strategies?” *American Journal of Agricultural Economics* 95, no. 4 (2013): 917-931.

Paul T. Cohen offers a different perspective on eradication in “The Post-Opium Scenario and Rubber in Northern Laos: Alternative Western and Chinese Models of Development.” Instead of predicting the effects of eradication through an econometric analysis, he details the economic hardships and social dislocation caused by an effective eradication campaign without the support of alternative development.³⁶ Though the focus on his article is the convergence of Chinese and Western models of development, it is important to understand the implications of a successful eradication campaign without available alternative livelihoods.

In summary, three out of the four econometric studies found an increase in eradication predicted in an increase in illicit crop cultivation. The fourth found eradication to indirectly reduced illicit crop cultivation through displacement. Two out of the four studies provided evidence in support of alternative development. In those studies, an increase in farm-gate prices of an alternative crop, state presence, and access to markets as well as economic development all resulted in a decrease in illicit crop cultivation. Additionally, one study supported the balloon effect through its conclusions on displacement. And finally, while Cohen did not offer an econometric analysis on eradication, he provided an account of its effects when it is not partnered with sufficient alternative development.

³⁶Paul T. Cohen, “The Post-Opium Scenario and Rubber in Northern Laos: Alternative Western and Chinese Models of Development,” *International Journal of Drug Policy* (September 2009): 2.

Multi-Component Comparisons

Counternarcotics literature that goes beyond the discussion of alternative development and eradication is rare and thus important to the overall body of literature. Two examples are provided by Catalano and Felbab-Brown et al. Catalano compares the effects of security, alternative development, and eradication within different departments of Colombia. Felbab-Brown et al. present a comprehensive analysis of all the counternarcotics components applied in Colombia.

Catalano's paper is titled "The Efficacy of Foreign Assistance in Counternarcotics." It is unique in the fact that it attempts to compare three separate counternarcotics components. Most academic literature focuses on the efficacy of one or a comparison of two. While the objective of the study is to determine the overall efficacy of foreign assistance in counternarcotics, its true contribution to the body of literature is found in the comparative analysis of counternarcotics components. It illustrates that the long-term expansion of military and government presence is the most effective starting point for a counternarcotics strategy when compared with eradication and alternative development. It also concludes that counternarcotics initiatives conducted in isolation are rarely successful.³⁷

Felbab-Brown's report is titled "Assessment of the Implementation of the United States Government's Support for Plan Colombia's Illicit Crop Reduction Components." The report was written by a team of specialists in economic policy, alternative development, law and security, and comparative drug control tasked to examine 10 years

³⁷Jonathan R. Catalano, "The Efficacy of Foreign Assistance in Counter Narcotics" (Master's thesis, Naval Postgraduate School, 2013), 44.

of counternarcotics efforts in Colombia. It uses documents, interviews, econometric regressions, and simulations to determine the effects of alternative development, eradication, security, and state presence. The economic regressions predict a negative relationship between eradication and coca cultivation when a lagged variable is used. One of the overall conclusions from the report is that the role of state presence is crucial for the success of counternarcotics efforts.³⁸ The study also determines that Plan Colombia dramatically improved security throughout the country and successfully reduced the cultivation of opium poppy, but only had localized successes in eliminating coca cultivation. Another conclusion found in the report is that while interdiction, eradication, and alternative development can singly reduce coca production, an integrated program displays synergistic effects.

Annual Reports

Another important source of counternarcotics information is found in annual reports. The majority of these reports are published by the UNODC, though the US Government also contributes. The Department of State consolidates a large portion of its quantitative data in the *International Narcotics Control Strategy Report*. The UNODC annually publishes a *World Drug Report*, which provides a global review of illicit drugs including cultivation, eradication, and interdiction data. It also produces a *Peru Coca Cultivation Survey*, *Colombia Coca Cultivation Survey*, and *South East Asia Opium Survey*. These contain data on illicit crop cultivation, eradication, and alternative development at the country and regional level. UNODC's Andean Coca Studies are

³⁸Felbab-Brown, et al., iv.

annual reports that combine summaries of Colombia, Peru, and Bolivia in one document. UNODC also publishes updates on alternative development projects done in the area.

Performance Measures

Finally, essential to any discussion on the effectiveness of counternarcotics components are proper performance measures. This is the primary focus for some pieces of academic literature. William H. Dunn advocates the determination of useful measures of effectiveness through general systems theory in “In Search of Measures of Effectiveness for Counterdrug Operations.”³⁹ General systems theory uses the concept of systems operating within systems to analyze a problem, with a system defined as a set of components that affect a single objective. One challenge of general systems theory is determining all of the components within a system and how they interact with one another. An added complexity is that single components can be part of multiple systems simultaneously. Measures of effectiveness determine how well a certain action is meeting its operational objective or need. Dunn defines the ideal measure of effectiveness as quantitative, measureable, objective, directly related to the system’s performance, and comparable to alternative measures.⁴⁰

In 2010, the Government Accountability Office identified several ways for agencies to utilize performance information: “(1) identify problems and take corrective actions, (2) develop strategy and allocate resources and (3) identify and share effective

³⁹William H. Dunn, “In Search of Measures of Effectiveness for Counterdrug Operations” (Study Project, U.S. Army War College, 1993), 4.

⁴⁰*Ibid.*, 8-9.

approaches.”⁴¹ In 2012, the Government Accountability Office concluded that “without reliable information, Congress and other decision makers, including the Office of National Drug Control Policy, may lack information that is essential to assessing progress towards the U.S. goal of curtailing illicit drug consumption in America, making decisions on the allocation of resources, and conducting effective oversight.”⁴² The Department of State uses two performance measures: hectares of illicit crops eradicated and kilos of narcotics seized, though it is trying to determine more performance measures that do not focus on eradication. USAID uses hectares of land devoted to cultivating licit crops in areas receiving USAID assistance and number of jobs created by alternative development projects each year. Drug Enforcement Administration uses the numbers of DTOs disrupted and DTOs dismantled. Department of Defense, which is involved in training and military support, currently struggles in reporting performance measures due to the challenges of creating performance measures that accurately assesses its program outcomes.

One of the most comprehensive lists of recommended performance measures is provided in “Assessment of the Implementation of the United States Government’s Support for Plan Colombia’s Illicit Crop Reduction Components.” Felbab-Brown et al. recommend the following: “(1) the numbers of hectares cultivated with illicit crops, (2) the number of hectares eradicated, (3) the number of municipalities free from illicit crop

⁴¹United States General Accounting Office, *Drug Control: DOD Needs to Improve Its Performance Measurement System to Better Manage and Oversee Its Counternarcotics Activities* (Washington, DC: United States General Accounting Office, 2010), 15.

⁴²United States General Accounting Office, *Counternarcotics Assistance*, 20.

cultivation, (4) the percentage of the size of the illicit economy per GDP and per the size of the economy in every sub-national region, (5) human development indicators of illicit crop farmers and populations vulnerable to illicit crop cultivation, and (6) the availability to illicit crop farmers of comprehensive licit livelihoods resources.”⁴³ This list, however, does not include any indicators of state presence or security.

Performance measures necessary for the reduction of illicit crop cultivation are presented in chapter 5. They have been collected throughout this literature review as well as during the analysis of data in chapter 4. Performance measures allow for an evaluation of the effectiveness of a strategy in reducing illicit crop cultivation. They also assist research to determine adjustments to the strategy as necessary.

⁴³Felbab-Brown, et al., vi.

CHAPTER 3

RESEARCH METHODOLOGY

The purpose of this chapter is to define a methodology that will either prove or disprove the existence of a universal framework for the strategic reduction of illicit crop cultivation in source countries. Evidence that supports the existence of at least two or more universal principles will prove that a framework does exist, even if all of the principles are not known in their entirety. In the absence of any universal principles, it will be assumed that a universal framework does not exist. The results will be inconclusive if only one universal principle can be discovered, as a single principle does not prove the existence of a framework.

Systematic Approach

Qualitative and quantitative analysis of data found in academic literature will identify any existing trends within the results of counternarcotics components. Illicit crop cultivation data from the UNODC coca and opium cultivation surveys will also be analyzed to identify any additional trends. Trends with substantial evidence that applies to multiple countries will be deemed universal; gaps in qualitative and quantitative data will be identified for further study. If two or more universal principles are established, an attempt will be made to order them within a universal framework.

Quantitative Research Methods

Quantitative data is preferable to qualitative data in determining unbiased relationships. Simple scatter plots will be used to determine relationships between two variables when sufficient quantitative data exists. When applicable, linear regressions

will refine positive or negative relationships between variables. Hectares of illicit crops cultivated or eradicated provide the basis for the majority of quantitative data available.

Illicit crop cultivation is primarily approximated through the use of satellite imagery. Due to the limited availability of satellites, only areas suspected of illicit cultivation are targeted for satellite imagery, allowing for the possibility of unaccounted cultivation occurring in unknown areas. Farmers in South America will also cultivate illicit crops under canopy, which does not show up on satellite imagery, in order to avoid detection.

Hectares of illicit crops eradicated are quantifiable data points for analysis as well. Eradication, however, can occur throughout the year. This is particularly true in South America, because coca can be harvested multiple times in a year. It should be noted that the same hectare of land that is eradicated twice will count as two hectares of coca eradicated.

This thesis will generally not use data on the production of illicit narcotics due to the fact that those numbers are simply estimates derived from cultivation data. The purity of illicit narcotics seized around the world and their price will also not be addressed in this paper. This is due to the numerous factors, largely incalculable, that relate the purity of illicit narcotics and price to changes in illicit crop cultivation.

Qualitative Research Methods

The majority of data other than the amount of illicit crop cultivation and eradication is presented qualitatively. It is generally derived from reports that summarize interviews or experiences of farmers and agencies implementing counternarcotics

components. In many cases, qualitative data will be required due to the lack of sufficient quantitative data.

CHAPTER 4

ANALYSIS

The goal of this chapter is to provide analysis of available qualitative and quantitative data in order to substantiate a universal counternarcotics framework that strategically reduces illicit crop cultivation in source countries. Due to availability of data, the analysis is focused on the three counternarcotics components that the US has historically used to reduce illicit crop cultivation: state presence and security, eradication, and alternative development.⁴⁴ Literature typically refers to interdiction as the third component instead of state presence and security, most likely because interdiction is easier to quantify. This chapter instead examines state presence and security as the necessary precursors for effective interdiction. State presence and security both directly and indirectly affect farmers while interdiction generally targets DTOs.

Overall, this chapter examines the application of state presence and security, alternative development, and eradication over multiple countries. The first section, though, examines the balloon effect and its implications in order to understand the global environment in which counternarcotics strategies operate. The second section discusses the requirement of state presence and security to any effective counternarcotics strategy. The third section analyzes eradication and its ability to motivate farmers. The fourth section examines alternative development, determining its effectiveness and some of the requirements to its successful application. The fifth section establishes the requirement

⁴⁴USAID/Peru, 1.

for the coordination of multiple counternarcotics components. The final section concludes the analysis presented in this chapter.

The Balloon Effect

Before analyzing individual components of a counternarcotics strategy, it is important to examine the global environment in which it operates. A counternarcotics strategy needs to attack illicit cultivation in targeted areas, but also as part of an overall global strategy. The balloon effect is the most prevalent argument for why counternarcotics strategies may work locally but not globally. Logic and induction are the foundation for the existence of the balloon effect, though there is quantitative data to support it as well. The most quantitative data to support the balloon effect comes from the migration of coca cultivation around South America. The migration of opium cultivation from the Golden Triangle (Thailand, Myanmar, and Laos) to the Golden Crescent (Afghanistan and Pakistan) is another example, though there is less data to substantiate this case.⁴⁵

The logic behind the balloon effect is based on cause and effect. As supply-reduction initiatives have an effect on one area, the overall supply of that drug is reduced. As supply is reduced, the street price goes up. As the subsequent street price of the product goes up, there is more incentive to produce the illicit crop. As the incentive to cultivate the illicit crop is raised, it eventually finds a new area, where there is less effort being made to counter the illicit cultivation.

⁴⁵Julia Buxton, “Julia Buxton on the Drug Trade ‘Balloon Effect’ . The ‘Golden Triangle’ to the ‘Golden Crescent,” Film Exchange on Alcohol and Drugs, <http://www.fead.org.uk/video307/Julia-Buxton-on-the-drug-trade-'Balloon-Effect'-.The-'Golden-Triangle'-to-the-'Golden-Crescent.html> (accessed May 16, 2013).

Coca cultivation estimates from Bolivia, Colombia, and Peru support the balloon theory (figure 1). While coca cultivation in Bolivia and Peru decreased over time, cultivation increased in Colombia. Note that while the total coca cultivation for all three areas fluctuates, the average remains generally constant during these changes. In order to prove the balloon effect, though, one would also need to demonstrate that the counternarcotics pressures within Peru and Bolivia are higher than those in Colombia.

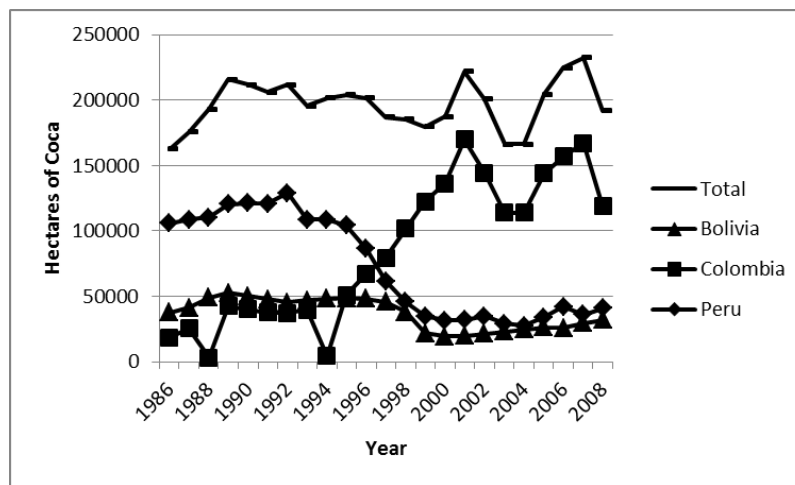


Figure 1. Coca Cultivation in South America

Source: Data from United Nations Office for Drug Control and Crime Prevention, *Global Illicit Drug Trends 1999* (New York: United Nations Office for Drug Control and Crime Prevention, 1999); United Nations Office on Drugs and Crime, *World Drug Report 2006, Volume 2: Statistics* (Vienna: United Nations Office on Drugs and Crime, 2006); United Nations Office on Drugs and Crime, *World Drug Report 2010* (Vienna: United Nations Office on Drugs and Crime, 2010).

This counternarcotics pressure is demonstrated by Rouse and Arce by establishing a negative correlation between US military aid and coca cultivation.⁴⁶ US military aid is

⁴⁶Rouse and Arce, 553.

determined to be a gauge of counternarcotics pressure, due to the fact that military aid attributed for almost all of the US counternarcotics assistance to Andean countries during the time of the study. While the study does not prove causality, it does show that counternarcotics pressure was present during the reduction of coca cultivation. These results add empirical evidence to the argument for a balloon effect.

While quantitative data could not be found for opium cultivation between 1970 and 1990, Julia Buxton discusses the migration of opium from the Golden Triangle to the Golden Crescent in a Film Exchange on Alcohol and Drugs video.⁴⁷ She explains how the decline in the late 1970s and early 1980s of opium cultivation in Thailand and Burma were the catalyst for a significant rise of opium cultivation in Afghanistan and Pakistan. Thailand's reduction was attributed to alternative development conducted within the country. She attributes Burma's reduction to drought, though it should be noted that by 1986 Burma was experiencing massive expansion in its area under illicit crop cultivation.⁴⁸ This case provides additional qualitative evidence for the balloon effect.

Logic, quantitative evidence, and qualitative evidence provide enough evidence to induce that the balloon effect is a legitimate principle. Illicit cultivation migrates to areas with the lowest counternarcotics pressure. The balloon effect, however, does not determine if the migration of illicit cultivation is due to the displacement of farmers to new areas, new farmers reacting to new incentives, or a combination of both.

⁴⁷Buxton.

⁴⁸United Nations Office for Drug Control and Crime Prevention, *Global Illicit Drug Trends* (New York: United Nations 1999), 23.

The Sustainable Effects of Counternarcotics Strategy

The balloon effect only works because areas with low counternarcotics pressure exist. Thailand provides an example of how a successful counternarcotics strategy can make a source country largely resistant to illicit crop cultivation. Thailand has sustained significantly lower levels of illicit opium poppy than its neighbors for over a decade, even after the majority of foreign assistance was removed. The alternative development model that evolved in Thailand reduced opium poppy cultivation by over 97 percent over the course of 30 years (figure 2). Over the past decade, while Thailand's neighbors have seen a rise in the cultivation of opium poppy, Thailand has continued to remain resistant. It should be noted that before 1984, there was no national eradication policy within Thailand. Forced eradication, conducted by the Thai government, began in 1984. Also, as previously mentioned, counternarcotics strategies in Thailand stressed local participation and government presence.

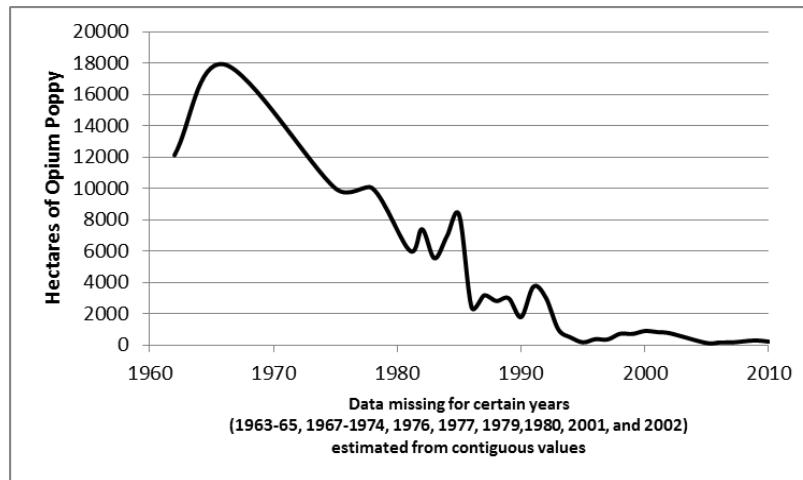


Figure 2. Opium Poppy Cultivation in Thailand

Source: Data from Ronald D. Renard, *Opium Reduction in Thailand, 1970-2000: A Thirty Year Journey* (Bangkok: Silkworm Books, 2001); Graham Farrell, “A Global Empirical Review of Drug Crop Eradication and United Nations’ Crop Substitution and Alternative Development Strategies,” *Journal of Drug Issues*, 28, no. 2 (Spring 1998): 395-436; United Nations Office for Drug Control and Crime Prevention, *Global Illicit Drug Trends 1999* (New York: United Nations Office for Drug Control and Crime Prevention, 1999); United Nations Office on Drugs and Crime, *World Drug Report 2006, Volume 2: Statistics* (Vienna: United Nations Office on Drugs and Crime, 2006); United Nations Office on Drugs and Crime, *World Drug Report 2010* (Vienna: United Nations Office on Drugs and Crime, 2010); United Nations Office on Drugs and Crime, *Opium Poppy Cultivation in the Golden Triangle* (Vienna: United Nations Office on Drugs and Crime, 2006); United Nations Office on Drugs and Crime, *South East Asia Opium Survey* (Vienna: United Nations Office on Drugs and Crime, 2007-2010).

The most significant aspect of Thailand’s counternarcotics strategy is its ability to thus far withstand the test of time. The fact that Thailand has remained largely resistant to the illicit cultivation of opium poppy for over a decade after the majority of international donors removed their support is unique. In a world supposedly dominated by the balloon effect, Thailand gives the international community hope that the illicit cultivation of drugs can be eventually be permanently reduced, if not eliminated. While Thailand’s cultivation still fluctuates, it has remained steadily below 2000 hectares since 1992. The

neighboring countries of Laos and Myanmar have both had their opium cultivation more than double in the past six years (figure 3).

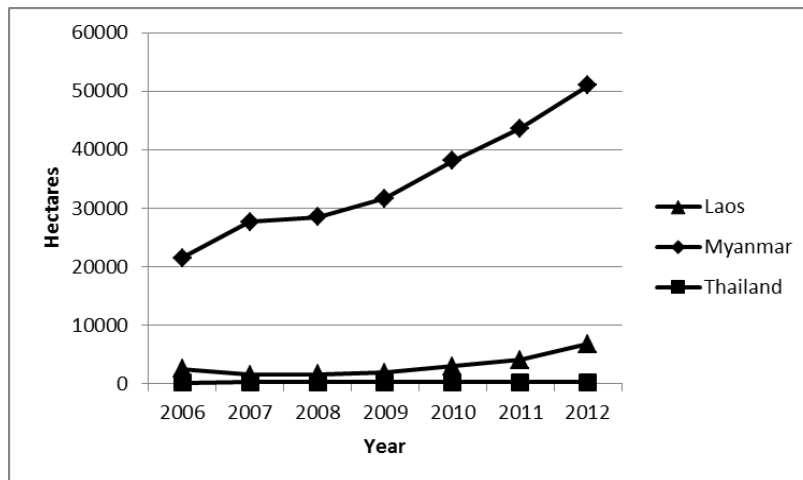


Figure 3. Opium Cultivation in South East Asia

Source: United Nations Office on Drugs and Crime, *South East Asia Opium Survey* (Vienna: United Nations Office on Drugs and Crime, 2007-2012).

The Global Reduction of Illicit Cultivation

In addition to evidence of sustainable counternarcotics effects, data also shows a global reduction in illicit cultivation over the last two decades. Figure 4 depicts the amount of illicit coca and opium poppy cultivated across the globe by year for the last twenty years. Figure 5 depicts the subsequent potential production of illicit narcotics based off of those cultivation figures. The graphs do not exactly mirror one another due to the constant streamlining of production of illicit drugs performed by DTOs. Increased efficiency in production has allowed DTOs to produce more drugs with fewer crops. While counternarcotics efforts may be one of the reasons for the decrease in cultivation,

an argument could be made that the overall demand for illicit crops has been reduced due to an increase in efficiency by DTOs in the production of illicit drugs. Whatever the cause, less land is under illicit cultivation today than 20 years ago. Thus, while the balloon effect predicts that counternarcotics pressure simply pushes illicit cultivation into a new area, history has shown a reduction over time.

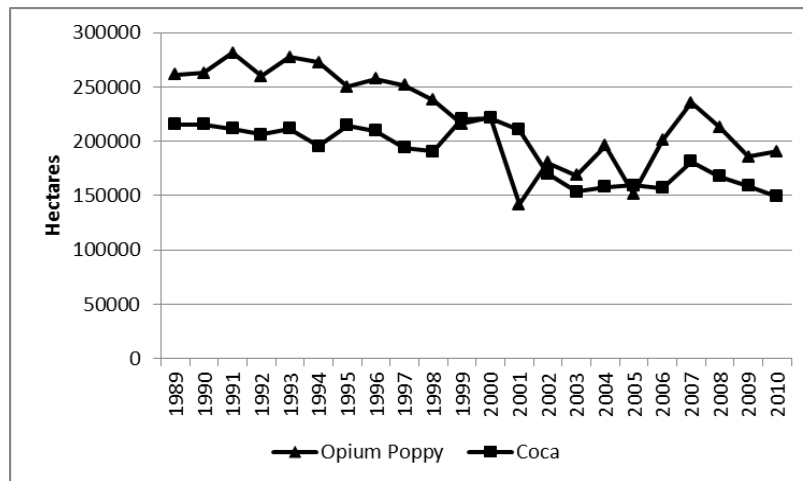


Figure 4. Global Cultivation of Illicit Narcotics

Source: Data from United Nations Office for Drug Control and Crime Prevention, *Global Illicit Drug Trends 1999* (New York: United Nations Office for Drug Control and Crime Prevention, 1999); United Nations Office on Drugs and Crime, *World Drug Report 2006, Volume 2: Statistics* (Vienna: United Nations Office on Drugs and Crime, 2006); United Nations Office on Drugs and Crime, *World Drug Report 2010* (Vienna: United Nations Office on Drugs and Crime, 2010).

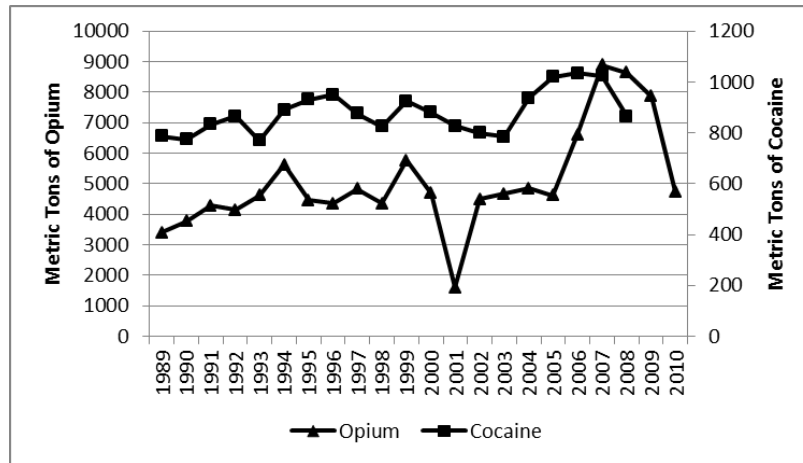


Figure 5. Estimated Potential Production of Illicit Narcotics

Source: Data from United Nations Office for Drug Control and Crime Prevention, *Global Illicit Drug Trends 1999* (New York: United Nations Office for Drug Control and Crime Prevention, 1999); United Nations Office on Drugs and Crime, *World Drug Report 2006, Volume 2: Statistics* (Vienna: United Nations Office on Drugs and Crime, 2006); United Nations Office on Drugs and Crime, *World Drug Report 2010* (Vienna: United Nations Office on Drugs and Crime, 2010).

State Presence and Security

With a better understanding of the global environment, this thesis subsequently examines each of the US's major components to a counternarcotics strategy. The first topics of analysis are state presence and security. Few articles are written specifically about the effects of state presence and security on illicit crop cultivation, but the topics and subsequent evidence appears throughout a considerable portion of counternarcotics literature. The overall premise is that state presence and security are vital prerequisites for alternative development and eradication.

The UNODC, General Accounting Office, and USAID assert that state presence, government control, and security are essential to successful counternarcotics efforts in

various works of literature.⁴⁹ Unlu and Kapti blame security issues for the failed alternative-crop programs and infrastructure projects in Bolivia.⁵⁰ Ferrell concludes that effective control of an area by a central government is a prerequisite for alternative development based on his examination of alternative development programs in 11 different countries.⁵¹ Finally, Catalano analyzes six Colombian departments and determines that the two with ineffective aerial eradication campaigns resulted from either a lack of state presence or security (table 1). Enhanced security measures occurred in all four of the departments that displayed significant reductions in cultivated coca.⁵²

⁴⁹United Nations Office on Drugs and Crime, *Alternative Development*, vi; United Nations Office on Drugs and Crime, *Sharing Experiences on Alternative Development*, 29; United States General Accounting Office, *Drug Control: Efforts to Develop Alternatives to Cultivating Illicit Crops in Colombia Have Made Little Progress and Face Serious Obstacles*, 5; Vanda Felbab-Brown, et al., iv; USAID/Peru, 6.

⁵⁰Unlu and Kapti, 162.

⁵¹Farrell, 429.

⁵²Catalano, 31-42.

Table 1. Effect of Eradication, Security, and Alternative Development on Coca Cultivation in Colombian Departments	
Department	Results
Guaviare	Significant reduction of cultivated coca in Guaviare is largely a result of aerial eradication and enhanced security/interdiction
Caquetá	Significant reduction of cultivated coca is largely a result of aerial eradication and enhanced security
Putumayo	Coca reduction attributed to an aggressive aerial eradication campaign followed by an equally aggressive military presence under Plan Patriota and Plan Consolidación
Nariño	Ineffective coca reduction despite aerial eradication; attributed to lack of presence and alternative development programs
Norte de Santander	Significant reduction of cultivated coca largely a result of the combined efforts from eradication, enhanced security, extensive development, and economic conditions that favored more profitable substitutes to coca
Cauca	Ineffective coca reduction despite aerial eradication and alternative development; attributed to a lack of security
Overall	Security issues were the largest deciding factor in whether or not the department experienced a reduction in illicit crop cultivation

Source: Jonathan R. Catalano, “The Efficacy of Foreign Assistance in Counter Narcotics” (Master’s thesis, Naval Postgraduate School, 2013), 31-42.

The criticality of state presence and security within counternarcotics strategies is supported by substantial literature. The majority of evidence supports the need for sufficient state presence and security in order for alternative development and eradication to be effective. Unfortunately, there is insufficient evidence to designate the level of state presence and security necessary for efficacy. There is also insufficient evidence to determine if effective levels of state presence and security differ between areas and what variables would lead to that difference.

Eradication

While state presence and security are generally considered additional factors in counternarcotics literature, eradication is a central issue in numerous articles. Out of the

three US components to counternarcotics strategy, eradication has the most quantitative data available. This section is separated into two subsections: the limit to farmers' tolerance of eradication and a review of previous econometric analyses of eradication. The hypothesis that farmers have a limit to their tolerance of eradication is a novel premise introduced in this thesis and supported by data. It predicts that a threat of eradication that exceeds the farmers' limit will reduce the number of illicit crops planted in the following year. At this point there is no method other than historical analysis to predict the specific limit. As for econometric analyses, many predict that an increase in eradication will cause an increase in the area under illicit crop cultivation. However, there are also studies that predict an increase in eradication to cause a decrease in illicit crop cultivation.

Before one can properly analyze eradication data, one must understand what data is available. First, illicit markets operate outside of regulation by definition. Thus, most quantitative data on illicit crops are estimations. Second, there are multiple variations of comparing eradication and illicit crop cultivation. Table 2 defines eradication terms created for this thesis. The first two terms in table 2 are the two most common quantitative measurements used in academic literature to determine the effects of eradication. Harvested Illicit Crops (HIC) is determined by satellite imagery once per year. While the area under illicit crop cultivation will vary throughout the year due to the eradication and replanting of crops, this annual snapshot of illicit crop cultivation is accepted as an accurate estimation for the number of hectares that successfully produce illicit crops throughout the year. Eradicated Crops (EC) is a number published by the government or agency eradicating crops throughout the year. It is the total number of

illicit crops that were destroyed. As technology improves, these numbers become more and more accurate.

Table 2. Eradication Terms	
Harvested Illicit Crops (HIC)	The number of hectares on which a farmer is estimated to have successfully cultivated illicit crops
Eradicated Crops (EC)	The number of hectares that the government eradicated over the course of a year
Total Planted Illicit Crops (TPIC)	Eradicated Crops added to Harvested Illicit Crops
Threat of Eradication (ToE)	Eradicated Crops divided by Total Planted Illicit Crops
Limit to the Tolerance of Eradication (LIM)	The Threat of Eradication that results in a reduction of Total Planted Illicit Crops in the following year

Source: Created by author.

While traditional counternarcotics analysis only uses HIC and EC, this thesis proposes additional measurements: Total Planted Illicit Crops (TPIC), Threat of Eradication (ToE), and the Limit to the Tolerance of Eradication (LIM). HIC only indicates what farmers were able to successfully harvest crops throughout the year. While this is a good indicator of their success, it is not a good indicator of their motivation. TPIC is the sum of HIC and EC and more adequately represents farmers' motivation. The drive of farmers is captured as the sum of HIC and EC because farmers planted both.

The following example is a hypothetical situation created for the illustration of the previous terms. If farmers planted 100 hectares of coca in an area, but the government eradicated 20 hectares, 80 hectares of coca remain. Thus, for that year, HIC equals 80 hectares, EC equals 20 hectares, and TPIC equals 100 hectares. The next year, the

farmers plant 70 hectares in addition to the 80 hectares that remain. This is done in order to compensate for the loss from the year before and the predicted loss from eradication for the upcoming year. The government, however, also increases their efforts and eradicates 80 hectares. For this second year, HIC equals 70 hectares, EC equals 80 hectares, and TPIC equals 150 hectares. When only comparing HIC, it appears the government is on a successful path due to the fact that HIC was reduced. In reality, if the trend continues the following year, the government will have to increase its eradication efforts even more in order to decrease HIC.

Instead, if the government was able to reduce the TPIC, it would be able to reduce its eradication efforts and still achieve similar results. As in the previous example, if farmers have planted 100 hectares of coca in an area and the government eradicates 20 hectares, there is 80 hectares of remaining coca after the first year. Imagine then, that in the next year the farmers only plant an additional 10 hectares. The government decides to maintain its eradication efforts at the same level and eradicates another 20 hectares of coca. For this second year, HIC is 70, EC is 20, but TPIC is only 90. If this trend continues, the government can maintain its eradication program at the same level and eventually eradicate all the coca in the area. The difference in the two examples is caused by the motivation of the farmers. TPIC is the best way to measure that motivation. In the first year, TPIC went up, in the second year, TPIC went down.

This difference between evaluating TPIC versus HIC is vitally important to counternarcotics strategies. A long-term, sustainable counternarcotics strategy must target the motivation of farmers, not simply try to outperform them. A policy that targets

farmers' motivation should see a reduction in costs as farmers lose their drive. A policy that attempts to outperform farmers potentially sees a rise in costs over time.

The Limit to Farmers' Tolerance of Eradication

The simplest way to target farmers' motivation is to provide a ToE that exceeds the LIM of the area. Interviews with Peruvian and Colombian coca growers show that the threat of eradication is the largest motivator to transition to licit crops,⁵³ yet academic literature is generally absent of a discussion about LIMs. When farmers compensate for the previous year's ToE, farmers increase the amount of coca they plant as ToE is increased. At some point, however, farmers will no longer be able to compensate. Farmers will have a tolerance for the ToE but as their LIM is reached, they will either seek alternative work or move to an alternative location. As long as the ToE is maintained at that LIM, illicit crop cultivation should not increase. Levels of threat that exceed that tolerance should result in a reduction of total planted coca. In this thesis, Colombia, Peru, and Thailand provide case studies for the ToE and changes in TPIC, due to the availability of eradication data as well as histories within the countries of both increases and decreases in TPIC.

Colombia

Twelve different Colombian departments provided coca cultivation and eradication data from 1999 to 2012. Figure 6 plots the percent change in TPIC against the ToE. A trend line was then fitted using an ordinary least squares regression. As expected,

⁵³Office of National Drug Control Policy, "Coca in the Andes," The White House, <http://www.whitehouse.gov/ondcp/targeting-cocaine-at-the-source> (accessed August 19, 2013).

the change in TPIC trends towards the negative as the threat of eradication is increased.

While individual tolerances of farmers may vary based on different variables, logic predicts that as the ToE is increased, the chance of reaching the LIM is increased.

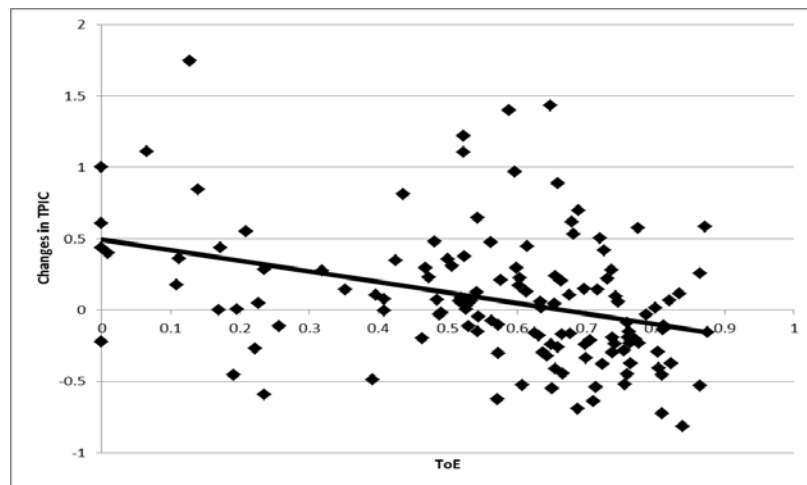


Figure 6. Changes in TPIC versus ToE with Trendline

Source: United Nations Office on Drugs and Crime, *Colombia Coca Cultivation Survey* (Vienna: United Nations Office on Drugs and Crime, years 2002-2012).

Charts that plot the percent change in TPIC against the ToE in a specific department support the premise of LIM. The data for Guaviare predicts a LIM equal to a ToE just below the three points with the highest ToE, around 68 percent (figure 7). The three years with a ToE higher than this LIM resulted in a negative change in TPIC. The years below it vary. This would support a hypothesis of a LIM. In Caquetá, the data predicts a LIM between 55 percent and 65 percent (figure 8). There is one data point that provides an anomaly, where a ToE higher than this LIM resulted in an increase in TPIC. Otherwise, there are five points with a ToE higher than the LIM and the predicted

reduction in TPIC. Norte de Santander's data predicts a LIM of approximately 70 percent (figure 9). Three points of data with ToEs greater than 70 percent resulted in a reduction in TPIC. There is one anomaly of a ToE higher than the LIM resulting in an increase in TPIC. This occurred during the year with the lowest TPIC for the department. The LIM may rise when the TPIC drops to extremely low levels, or this one point may simply be an anomaly. The data from Putumayo predicts a LIM around 75 percent. Three out of the four points of data with ToEs that exceed this LIM resulted in a reduction in TPIC (figure 10).

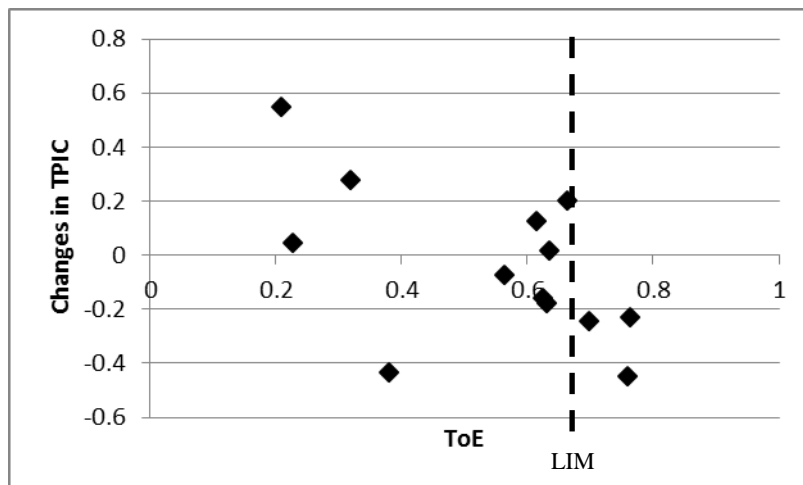


Figure 7. Change in TPIC versus ToE (Guaviare, Colombia)

Source: United Nations Office on Drugs and Crime, *Colombia Coca Cultivation Survey* (Vienna: United Nations Office on Drugs and Crime, years 2002-2012).

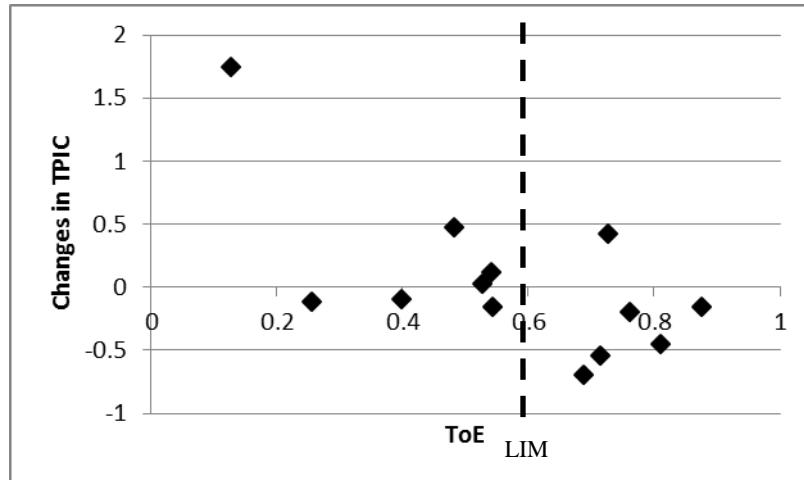


Figure 8. Change in TPIC versus ToE (Caquetá, Colombia)

Source: United Nations Office on Drugs and Crime, *Colombia Coca Cultivation Survey* (Vienna: United Nations Office on Drugs and Crime, years 2002-2012).

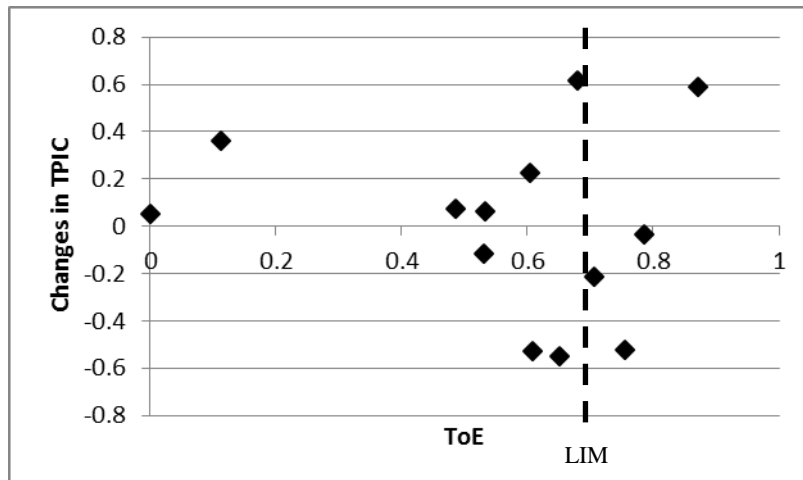


Figure 9. Change in TPIC versus ToE (Norte de Santander, Colombia)

Source: United Nations Office on Drugs and Crime, *Colombia Coca Cultivation Survey* (Vienna: United Nations Office on Drugs and Crime, years 2002-2012).

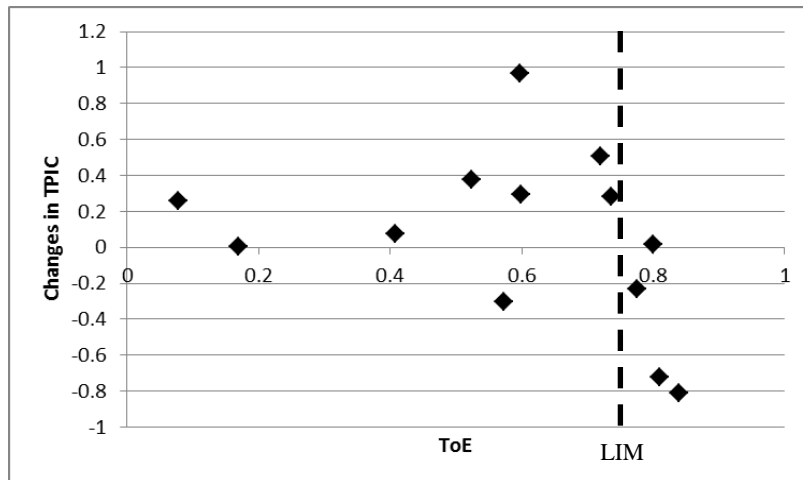


Figure 10. Change in TPIC versus ToE (Putumayo, Colombia)

Source: United Nations Office on Drugs and Crime, *Colombia Coca Cultivation Survey* (Vienna: United Nations Office on Drugs and Crime, years 2002-2012).

Peru

Coca cultivation and eradication data were also collected in Peru from 2005 to 2007. The results mirror those found in Colombia. At the time of this thesis, eradication only occurred in three regions: Huánuco, San Martín, and Ucayali. In Huánuco, the data predicts a LIM slightly over 20 percent (figure 11). San Martín could have a LIM anywhere from 25 percent to 80 percent (figure 12). The data for Ucayali also has a wide range for the possible LIM (figure 13). Out of the three points above this wide range, two reduce the TPIC and one does not.

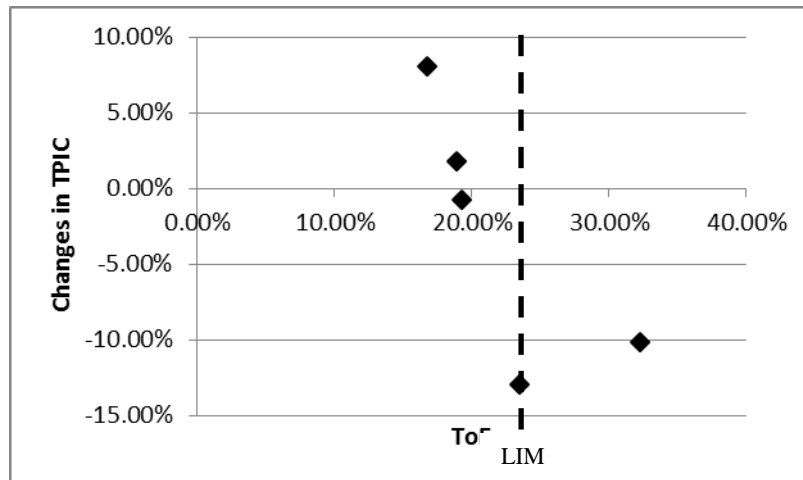


Figure 11. Change in TPIC versus ToE (Huánuco, Peru)

Source: Francisco Alvarez, Department of State, email correspondence with author; United Nations Office of Drugs and Crime, *Perú: Monitoreo de Cultivos de Coca* (Vienna: United Nations Office on Drugs and Crime, years 2008-2012).

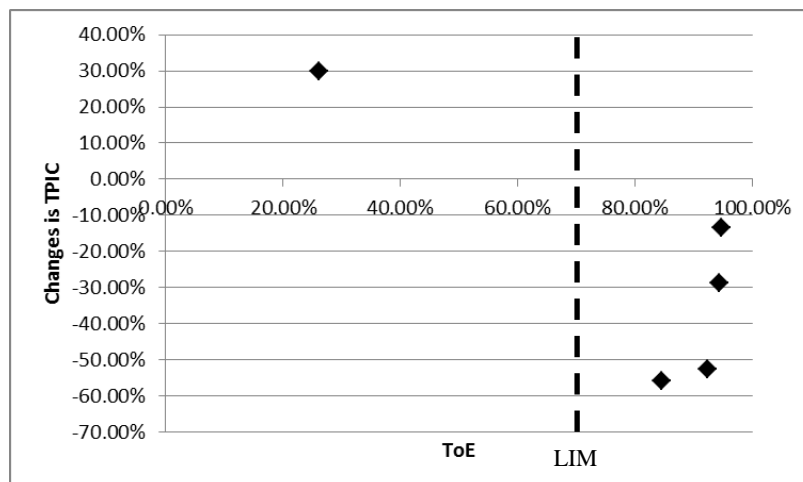


Figure 12. Change in TPIC versus ToE (San Martín, Peru)

Source: Francisco Alvarez, Department of State, email correspondence with author; United Nations Office of Drugs and Crime, *Perú: Monitoreo de Cultivos de Coca* (Vienna: United Nations Office on Drugs and Crime, years 2008-2012).

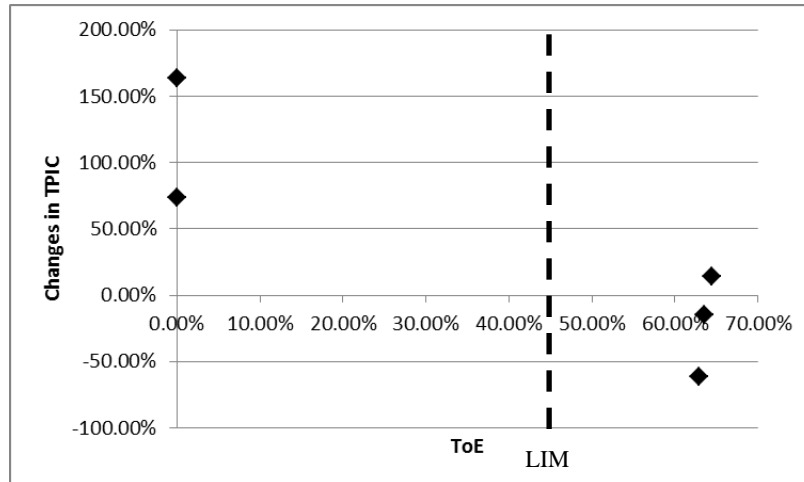


Figure 13. Change in TPIC versus ToE (Ucayali, Peru)

Source: Francisco Alvarez, Department of State, email correspondence with author; United Nations Office of Drugs and Crime, *Perú: Monitoreo de Cultivos de Coca* (Vienna: United Nations Office on Drugs and Crime, years 2008-2012).

Thailand

Data from Thailand from 1986 to 1994 also supports the premise of a threat of eradication threshold, though it should be noted that the majority of the data results in a reduction in TPIC (figure 14). The year with an increase of more than 60 percent occurred during a one year military coup. Assuming that the military coup caused a variance in the LIM, the remaining data predicts a LIM around 45 percent.

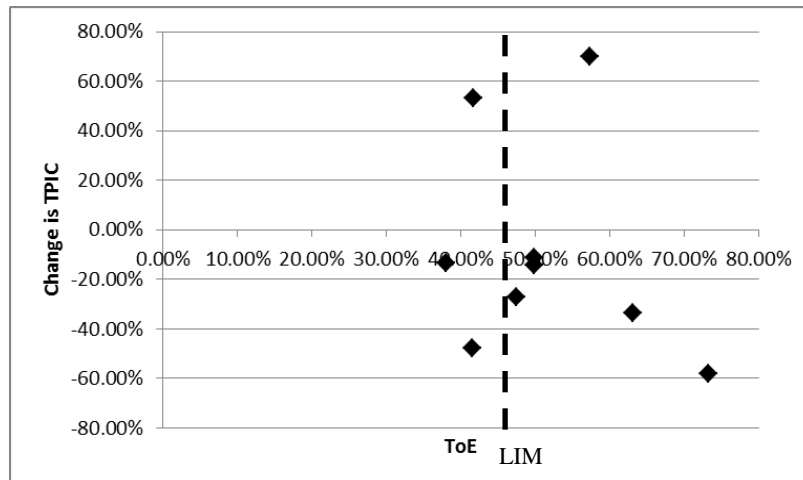


Figure 14. Change in TPIC versus ToE (Thailand)

Source: United Nations Office for Drug Control and Crime Prevention, *Global Illicit Drug Trends 1999* (New York: United Nations Office for Drug Control and Crime Prevention, 1999).

In 1995, the total opium poppy planted in Thailand was reduced from 1791 hectares to 748 hectares. This was the first time in the recorded history of opium cultivation in Thailand that the HIC dropped below 1500 hectares. Unfortunately, it slowly crept back to 1652 in 2001. This is in the face of a threat of eradication that ranged between 46 percent and 78 percent. The best explanation for this divergence from the previous pattern is aggressive efforts by DTOs:

According to ONCB [Thailand's Office of the Narcotics Control Board] analysts, from 1997 on the cartel began hiring farmers in Thailand to grow the poppy experimentally, under multiple conditions to learn how to maximize yield and avoid detection. This is confirmed by the price of opium being unusually high at the start of the growing season when, ONCB believes, the cartel is engaging the growers.⁵⁴

⁵⁴Renard, 38.

The case studies of Colombia, Peru, and Thailand all support the hypothesis of a LIM. They also show that LIMs can vary both between countries and within a country. Thus, they are most likely dependent on a certain number of variables. The anomaly in Thailand from 1995 to 2001 also shows that there might be external factors that can change the LIM of a particular area. Unfortunately, the data does not provide insight as to how to predict a LIM other than through the use of available historical data.

Econometric Analyses of Eradication

Econometric analyses of eradication and illicit crop cultivation in academic literature generally solve for a linear relationship between EC and HIC. The results of five econometric analyses have been summarized in table 3. Some of the econometric analyses determine that a positive relationship exists between the two, while some predict a negative relationship. However, none of these analyses take into account the ToE as a variable. One study did differentiate between coca fields within 80 miles of a fumigating base and those farther away. Coca fields within 80 miles of a fumigation base, on average, faced almost twice the threat of eradication as compared to those further than 80 miles away. Coca fields within 80 miles of a fumigation base, and thus facing a higher threat of eradication, were predicted to have a smaller resulting increase in coca cultivation due to eradication than those farther away, who faced a lower threat of eradication. It should be noted that all econometric analyses that also examined the relationship between alternative development and coca cultivation predicted a negative relationship between alternative development and coca cultivation.

Table 3. Comparison of Econometric Studies on Illicit Cultivation and Eradication				
Country	Time Period	Average ToE during Time Period	Relationship between Eradication and Illicit Crop Cultivation	Other Relationship established in the study
Colombia	1987-2001	16%	(+) Positive Relationship	(-) Negative Relationship with Alternative Development
Colombia	2001-2005	58%	(+) Positive Relationship	(-) Negative Relationship with Alternative Development (-) Negative Relationship with State Presence
Colombia	2001-2006	61%	(±) Neutral Direct Relationship (-) Negative Indirect Relationship due to Displacement	Though the level of threat was not an independent variable in the study, increases in eradication in areas with a higher initial threat of eradication exhibited a smaller increase in coca cultivation
Colombia	2000-2007	58%	(-) Negative Relationship with a lagged variable (+) Positive Relationship without a lagged variable	(-) Negative Relationship with Alternative Development after three years of implementation
Afghanistan	2006-2010	5%	(+) Positive Relationship	Positive relationship between opium poppy cultivation and eradication due to preference given to opium by credit market

Source: Rocio Moreno-Sanchez, David S. Kraybill, and Stanley R. Thompson, “An Econometric Analysis of Coca Eradication Policy in Colombia,” *World Development* 31, no. 2 (2003): 328; Michelle L. Dion and Catherine Russler “Eradication Efforts, the State, Displacement and Poverty: Explaining Coca Cultivation in Colombia during Plan Colombia,” *Journal of Latin American Studies*, 40 (2008): 420; Luis Carlos Reyes, “Estimating the Causal Effect of Forced Eradication on Coca Cultivation in Colombian Municipalities” (Master’s thesis, Michigan State University, 2011), 34; Vanda Felbab-Brown, Joel M. Jutkowitz, Sergio Rivas, Ricardo Rocha, James T. Smith, Manuel Supervielle, and Cynthia Watson, *Assessment of the Implementation of the United States Government’s Support for Plan Colombia’s Illicit Crop Reduction Components* (Washington, DC: Management Systems International, 2009), 17; Camilla I. M. Anderson, “Counterproductive Counternarcotic Strategies?,” *American Journal of Agricultural Economics* 95, no. 4 (2013): 919-920.

The Level of Threat during the Econometric Studies

This relationship between ToE and TPIC may also provide insight into the varied results of the previously discussed econometric studies. Econometric analyses that have a ToE above the LIM for the area should predict a negative relationship between CE and HIC due to farmers losing the motivation to replant illicit crops. Econometric analyses that have a ToE significantly below the LIM for the area should predict a positive relationship between EC and HIC due to farmers compensating for the losses from eradication. Econometric analyses that have a ToE relatively close to the LIM for the area could predict either a positive or negative relationship between EC and HIC, based on how the ToE is distributed throughout the area. A summary of these relationships is presented in table 4. If the national average LIM for Colombia was 60 percent the results shown in table 3 would correspond to those predicted by table 4.

Table 4. EC to HIC relationships due to ToE to LIM comparisons			
ToE to LIM Comparison	ToE > LIM	ToE = LIM	ToE < LIM
Predicted CE to HIC relationship	Negative	Varies	Positive

Source: Created by author.

Overall, in the absence of the relationship between ToE and LIM, econometric analyses of EC and HIC do not support one single conclusion about the relationship between the two variables. Different variables, different econometric models, and different ToEs of the time period of the study will predict contradictory relationships

between EC and HIC. When the case studies of ToE are combined with the analysis of econometric analyses, they provide coherent arguments for the theory of a LIM.

Alternative Development

Some alternative development studies focus on the overall effectiveness of alternative development while others analyze the proper application and sequencing of its different components. This section is broken into those two subsections: the overall effectiveness of alternative development and its sequencing. Evidence supports the fact that alternative development can be effective in drug control, but that the sequencing of programs is crucially important. Local community participation, human resources development, and investment in infrastructure are three areas that need to lead alternative development programs.

Overall Effectiveness of Alternative Development

Two sets of data are used to determine the overall effectiveness of alternative development: the results of Farrell's analysis in "A Global Empirical Review of Drug Crop Eradication and United Nations' Crop Substitution and Alternative Development Strategies," and UNDCP's calculations of the percentage of total illicit cultivation targeted by the alternative development projects in 1998. Farrell's analysis alone provides evidence to support the claim that alternative development can be an effective counternarcotics initiative at the local level. Data from the UNDCP quantifies the amounts of alternative development analyzed by Farrell.

Farrell analyzed the results of various United Nations development projects conducted in 11 countries. The majority of his research data occurred between 1960 and

1995. A summary of his conclusions is presented in table 5. Alternative development exhibited at least some drug control impact in six out of 10 countries. The impact of alternative development reached beyond the project area in three of those countries. And, alternative development displayed sustainable results beyond the project timeline in two countries. The vast differences in conditions within these countries as well as the variety in implementation of projects do not allow for any type of statistical analysis to be conducted, but these results do prove that alternative development can successfully reduce the cultivation of illicit narcotics in a targeted area. Under the right conditions, those results can be sustainable.

Table 5. The Impact of United Nations Socioeconomic Development Efforts in Areas of Illicit Cultivation, A Global Summary				
Country	Development Impact	Drug Control Impact	Sustainability of Drug Control	Displacement of Cultivation
Afghanistan	No	No	N/A	N/A
Bolivia	Some	Some reductions within project areas	-	Displacement and expansion elsewhere
Colombia	Some	Some reductions within project areas	-	Displacement and expansion elsewhere
Laos	Some	Some	-	-
Mexico	Some	No	-	Displacement and expansion elsewhere
Morocco	Some	No	N/A	N/A
Myanmar	No	No	-	-
Pakistan	Yes	Some	Yes	Over border to Afghanistan. Total displacement outside project area
Peru	Limited	Some reductions within project areas	-	Displacement and expansion elsewhere
Thailand	Yes	National 88% reduction poppy cultivation	Yes	Over Myanmar border
Note: Lebanon, while included in the analysis of Farrell's paper, was not included in his table due to unknown impacts of ongoing efforts while he was publishing the paper				

Source: Graham Farrell, "A Global Empirical Review of Drug Crop Eradication and United Nations' Crop Substitution and Alternative Development Strategies," *Journal of Drug Issues* 28, no. 2 (Spring 1998): 428.

Another set of data that should be taken into account when determining the effects of alternative development is the area that was covered by UNDCP alternative development projects. Table 6 presents the area covered by UNDCP projects as a percent of the total areas under illicit cultivation in seven countries. Farrell's conclusions on the drug control impact of the alternative development projects have been added in the far right column. Thailand has not been included in the list due to the fact that less than 0.01 percent of the arable land was under illicit cultivation in 1998, though Farrell determines that alternative development contributed to the 88 percent national reduction of opium poppy cultivation.

Table 6. Area under illicit cultivation covered by UNDCP projects						
Country	Arable land (ha) 1995	Area under illicit cultivation (ha) 1998	Area under illicit cultivation as % of arable land	Areas under illicit cultivation covered by UNDCP projects (ha) 1998	Area covered by UNDCP projects as % of area under illicit cultivation 1998	Drug Control Impact ⁵⁵
Afghanistan	7,910,000	63,612	0.80%	4,012	6.3%	No
Bolivia	2,130,000	28,000	1.31%	2,800	10.0%	Some
Colombia	2,406,000	77,000	3.20%	7,700	10.0%	Some
Laos	875,000	26,837	3.07%	1,660	6.2%	Some
Myanmar	9,540,000	130,300	1.36%	2,000	1.5%	No
Pakistan	21,050,000	950	0.00%	950	100%	Some
Peru	3,800,000	51,000	1.34%	5,100	10.8%	Some
Total	47,711,000	377,699	0.79%	24,222	6.4%	N/A

Source: United Nations Drug Control Programme, "Economic Viability of Alternative Development," 1999, http://www.unodc.org/pdf/Alternative%20Development/EconomicViability_AD.pdf (accessed August 13, 2013).

⁵⁵Farrell, 428.

Globally, UNDCP projects cover only 6.4 percent of areas under illicit cultivation. However, all countries that target over 10 percent of the area under illicit cultivation with alternative development projects are also countries in which Farrell determines alternative development to have had a drug control impact. In addition, alternative development was able to have a drug control impact at a national level in Laos, even while only targeting 6.2 percent of the area under illicit cultivation. This evidence supports a conclusion that alternative development can be effective, but may need to be applied to a sufficient percent of area in order to have an impact on drug control.

Sequencing of Alternative Development

While the targeting of a sufficient area may be important to the success of alternative development, the proper sequencing of its components is critical.⁵⁶ There is insufficient quantitative data to support one specific order for each component, but recommendations from reports and articles provide qualitative evidence for some of the essential initial requirements. Three areas that must lead alternative development are local community participation, human resources development, and investment in infrastructure.

The USAID/Peru states that local factors determine the success of alternative development.⁵⁷ Unlu and Kapti explain that successful alternative development programs use the local communities to determine plans that work through the existing community

⁵⁶United Nations Office on Drugs and Crime, *Alternative Development*, 16.

⁵⁷USAID/Peru, 7.

structures instead of requiring a complete community transformation.⁵⁸ Renard adds that local participation develops local human and institutional resources to deal with local problems.⁵⁹ UNODC simply states that local participation is vital throughout a project cycle.⁶⁰ Literature clearly highlights the importance of local community participation within an alternative development project. It is essential to establish this early in the sequencing of alternative development, not only to ensure that local participation will exist, but also to provide insight on local conditions.

A requirement for human resources development would logically correspond to a need for local participation due to inherent capacity building. Dirksen gives human resources development a strong endorsement by declaring it the most important program component of the Thai-German Highland Development.⁶¹ Unlu and Kapti explain that while most alternative development programs have ignored the development of human resources, successful programs require highly qualified human resources. They recommend that alternative development programs initially focus on human resources development.⁶² While these are the only two articles that strongly promote human resources development, the UNODC lists it as one of the 11 recommendations for the application of alternative development.⁶³ Logic and literary evidence place human

⁵⁸Unlu and Kapti, 160.

⁵⁹Renard, 168.

⁶⁰United Nations Office on Drugs and Crime, *Alternative Development*, vi.

⁶¹Dirksen, 1.

⁶²Unlu and Kapti, 167.

⁶³United Nations Office on Drugs and Crime, *Alternative Development*, 17.

resources development and local participation in the lead of alternative development programs.

Human resources and local participation can then be used to direct investments in infrastructure. UNODC states that roads and bridges are vital to development efforts.⁶⁴ Dion and Russler determine that local public infrastructure and market access are critical components of coca reduction efforts.⁶⁵ Felbab-Brown et al. explain that infrastructure that provides access to markets is a requirement for the success of alternative development.⁶⁶ Since human resources and local participation will be essential to the identification of necessary infrastructure development, logic dictates that investment in infrastructure will sequentially follow the establishment of those components. Logic also requires that reliable access to markets be established before crop substitution efforts commence. Thus, investment in infrastructure should closely follow local participation and human resources development, but precede crop substitution efforts.

There are numerous other components of alternative development that can be implemented in a country: seed subsidies, credit programs, etc. At this time, however, there is not enough literary evidence for one proper comprehensive sequence of all components. This makes local participation even more essential, in order to help determine the correct order for the region. What literary evidence does support is that

⁶⁴United Nations Office on Drugs and Crime, *Sharing Experiences on Alternative Development*, 77.

⁶⁵Dion and Russler, 399-421.

⁶⁶Felbab-Brown, et al., viii.

human resources development, local community participation, and investment in infrastructure must be in the lead of alternative development programs.

A Coordinated Approach

While counternarcotics components can be analyzed individually, academic literature establishes the need for a comprehensive, coordinated strategy. Catalano's analysis of departmental case studies in Colombia concludes that counternarcotics initiatives are rarely successful in isolation.⁶⁷ Felbab-Brown et al. determined that integrated counternarcotics initiatives exhibit synergistic effects, though they have historically been poorly coordinated.⁶⁸ Evidence has already been provided for the prerequisite of security within any counternarcotics strategy. The UNODC and Dion and Russler declare that successful eradication programs require alternative development.⁶⁹ Paul Cohen described the economic hardships and dislocation caused by eradication campaigns without the support of alternative development.⁷⁰ And Farrell ties eradication to successful alternative development programs.⁷¹ It is a logical conclusion that successful counternarcotics strategies will include all three components.

The San Martín model of Peru provides a case study of a current successful counternarcotics methodology that emphasizes the coordination between eradication and

⁶⁷Catalano, 41.

⁶⁸Felbab-Brown, et al., v.

⁶⁹United Nations Office on Drugs and Crime, *Alternative Development*, 14; Dion and Russler, 399.

⁷⁰Cohen, 2.

⁷¹Farrell, 429.

alternative development. It has effectively reduced regional coca cultivation in a country that had seen a significant rise in coca cultivation. This counternarcotics model reduced illicit cultivation of coca by 77 percent over four years.⁷² The only quantitative data available for this study was the amount of successful coca harvested in the Tocache River Basin as compared to other areas in Peru. Quantitative analysis of the threat of eradication in Peru was previously presented in this chapter. Quantitative data for alternative development was not available.

In 2005, programmed manual eradication was initiated in the district of Tocache. In 2006, the San Martín model was initiated, which consisted of pre-programmed eradication followed by alternative development. At first, there was a strong resistance to alternative development, due to the forced eradication.⁷³ However, a coordinated approach combining eradication and alternative development continued through 2009.

There are only four other river basins in Peru that demonstrated a reduction in coca cultivation over the same period of time: Mishollo, Puerto Pizana, Aspuzana, and La Morada. Mishollo and Puerto Pizana are located 17 miles to the northwest of Tocache. They are both within the San Martín Department, and it is assumed that they also fell under the San Martín model. Aspuzana and La Morada are located 50 miles to the southeast along the department border of San Martín and Huánuco and could be a result of the San Martín model as well.

Aguaytía River Basin provides a case study of the lack of coordination of counternarcotics components. Eradication was initiated in the Aguaytía River Basin in

⁷²United Nations Office on Drugs and Crime, *World Drug Report 2013*, 32.

⁷³Chemonics International Inc., 1.

2002. While the amount of eradication remained relatively consistent, it was generally performed on different areas each year. The initial drop in coca cultivation in 2003 was most likely a result of the initiation of eradication. While alternative development occurred in the Aguaytía River Basin as well, it was not coordinated with eradication until after 2009. From 2004 to 2009, coca cultivation levels almost tripled those found in 2001, a year that involved neither eradication nor alternative development. The example of Aguaytía River Basin helps distinguish the success found in San Martín. Overall, the San Martín model illustrates the significant benefits of the coordinated application of eradication and alternative development.

Conclusion of Analysis

This chapter examined the balloon effect, state presence and security, eradication, alternative development, and San Martín model as a case study. The balloon effect provided a global perspective on counternarcotics strategies. State presence and security, eradication, and alternative development provided analysis of the current counternarcotics components used by the US in multiple countries. Finally, the San Martín model provided a case study to examine the effects that coordination of current counternarcotics components can have.

The implications of the balloon effect on counternarcotics strategy is that programs and initiatives need to ensure sustainability of their progress. Thailand is the model for permanent reduction of illicit crop cultivation. It should also be noted that the overall global cultivation of illicit drugs has gone down in the last two decades, even if more drugs are being currently produced.

When looking for a starting point for a sustainable strategy, evidence points towards state presence and security. They are an absolute prerequisite for any counternarcotics strategy. Both are essential factors for the success of alternative development and eradication, though there is not enough evidence to empirically determine the amount of state presence and security necessary. There is also not enough evidence to determine if different states or areas would require more or less state presence and security to ensure an effective counternarcotics strategy.

As for eradication, there have been multiple econometric analyses performed in an attempt to correlate illicit crop cultivation and eradication. Data illustrates that the most important relationship may be between the ToE and illicit crop cultivation. Evidence supports the principle that farmers have a tolerance for eradication, but that this tolerance has a limit. By ensuring that the amount of eradication causes the ToE to exceed the farmer's limit, a counternarcotics effort will affect the TPIC instead of simply the HIC. Unfortunately, the only way to predict the LIM at this time is through historical analysis of the area that is being targeted.

While there is substantially less quantitative data on alternative development than eradication, there is enough evidence to demonstrate that alternative development can have an impact on drug control, at least at the local level. In order to be effective, however, alternative development may need to target a certain percentage of the total area under illicit cultivation. All alternative development projects that targeted at least 10 percent of the area under illicit cultivation were determined to have a reduction impact.

Evidence also supports the sequencing of certain components of alternative development. Local community participation is essential throughout any alternative development project, and thus needs to be established early. In conjunction with local community participation is the need for human resources development early in the process. After human resources development and local community participation have begun, investment in infrastructure should closely follow, based on guidance from the local community.

Finally, there is substantial qualitative evidence establishing the requirement of a coordinated approach to reducing illicit crop cultivation. The San Martín model provides an example of the success possible through the coordination of multiple counternarcotics components, even in the midst of growing illicit markets. While the San Marin model does not include every aspect of a successful counternarcotics strategy, it provides a sufficient starting point.

Overall, this chapter analyzed qualitative and quantitative data surrounding the balloon effect, state presence and security, eradication, alternative development, and the coordination of counternarcotics components. Multiple trends were established within the results of different counternarcotics strategies. These trends will be used in chapter 5 to determine universal principles and the existence of a universal framework for the strategic reduction of illicit crop cultivation.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

This chapter describes and integrates the trends found in quantitative and qualitative data analysis creating an outline for a universal counternarcotics framework that strategically reduces illicit crop cultivation in source countries. The first section discusses the ramifications that the balloon effect has on such a policy. The second section reviews the four universal counternarcotics principles. The third section describes the recommended framework, while the fourth section provides performance measures for a holistic counternarcotics framework. The fifth section discusses areas for further research, and the final section provides the overall conclusion for this thesis.

The Balloon Effect

Logic and historical evidence support the balloon effect. As supplies are reduced due to counternarcotics pressure, the incentive to cultivate illicit crops increases, leading to new cultivation in areas with less counternarcotics pressure. This model can explain the migration of coca cultivation throughout Andean countries and the migration of opium poppy from the Golden Triangle to the Golden Crescent. Rouse and Arce empirically demonstrate that the movement of coca crops in South America is related to the amount of counternarcotics pressure within each country. Overall, the evidence indicates that as counternarcotics strategies reduce illicit cultivation in one area, there is a greater chance that illicit cultivation will increase in other areas.

Some individuals use the balloon effect to argue that supply-side initiatives cannot have a global effect.⁷⁴ However, that conclusion may be premature. The balloon effect determines that supply-side initiatives need to be long-term and sustainable; otherwise supply-side initiatives create a continuous cycle of chasing illicit drug cultivation without progress. Evidence shows that the global cultivation of illicit crops has declined over the last 20 years. While it cannot be determined if this decline is due to global counternarcotics efforts, it at least establishes the fact that the global cultivation of illicit crops can be reduced. Historical evidence also shows that farmers in source countries can resist the rising incentives of illicit crop cultivation. Thailand's efforts against the cultivation of opium poppy demonstrate that counternarcotics strategies can provide a sustainable resistance to illicit crop cultivation. If illicit crop reduction is done strategically through sustainable, cost-effective methods, a new analogy for the balloon effect may be needed.

There is finite arable land in the world, and as more areas are able to provide sustainable resistance against illicit crop cultivation, it becomes more difficult for DTOs to find areas that will source their trade. Currently, coca is only grown in substantial quantities in three countries that are all found on the same continent. Together, the sum of the square miles of land of those three countries is less than three percent of the world. Opium poppy is more spread out, but almost 95 percent of it is grown in four countries, with over 85 percent produced in Afghanistan and Myanmar. Even if one includes the other two major source countries, Mexico and Laos, opium poppy is grown on less than three percent of the world's arable land. When a border is put on the available land for

⁷⁴Laffiteau, 1-18.

illicit crop cultivation, sustainable counternarcotics initiatives modify the balloon image. As areas become resilient against the drive to cultivate illicit crops, the “balloon” no longer has new area in which to spread. When areas become resilient against illicit crop cultivation, the balloon simply is squeezed until it pops. Thus, the balloon effect is important because it stresses the importance of a long-term sustainable approach to a counternarcotics strategy.

Long-term and sustainable approaches, however, are expensive. The international community donated over \$335 million over 30 years to development projects that targeted the opium-producing region of Northern Thailand.⁷⁵ The counternarcotics efforts in Thailand also benefited from Thailand’s growing national economy during that time.⁷⁶ The US spent nearly \$8 billion over 12 years implementing Plan Colombia.⁷⁷ While Colombia has seen a reduction in coca cultivation over that period of time, it is still one of the major sources of cocaine within the world. Recognizing that successful counternarcotics strategies will be capital and time intensive, efforts must be made to make them as cost-effective as possible.

While assuming it will eventually be possible to contain illicit narcotics cultivation, it should be noted that there are obvious historic examples of its spread. DTOs precipitated the spread of coca cultivation from Peru to Colombia in the 1990s due to counternarcotics pressure in Peru. Opium poppy farmers migrated from China to

⁷⁵Calculated from a table of Royal, UN, and Bilateral highland development projects in Northern Thailand; Renard, 70-71.

⁷⁶Dirksen, 6.

⁷⁷Michael Shifter, “Plan Colombia: A Retrospective,” *Americas Quarterly* 6, no. 3 (2012): 36.

Thailand in the late 19th century due to the violence. And opium poppy farmers spread from the Golden Triangle to Afghanistan in the 1980s due to multiple counternarcotics pressures. The fact that illicit crop cultivation has shown an ability to spread to new areas increases the need for cost-effective counternarcotics strategies. Money wasted on a current problem will not be available for a future one.

Principles of a Counternarcotics Strategy

Before discussing a universal framework, principles from the analysis in chapter 4 need to be established. There are four principles supported by the analysis provided in the previous chapter: (1) counternarcotics strategies require multiple coordinated components, (2) counternarcotics strategies must lead with state presence and security, (3) eradication reduces illicit crop cultivation when applied with sufficient threat, and (4) alternative development must be applied in the right sequence, leading with human resources development, local participation, and investment in infrastructure. These principles are essential to a cost-effective counternarcotics strategy.

The first fundamental principle is that counternarcotics strategies require multiple coordinated components. Qualitative data and the San Martín model demonstrate this principle. Literature establishes that successful eradication campaigns require alternative development, successful alternative development programs benefit from eradication, and state presence and security are essential to both eradication and alternative development. The San Martín provides an example of the effectiveness of coordinated eradication and alternative development efforts. Thus, money spent on uncoordinated approaches is wasted. Uncoordinated approaches may show some effectiveness in reducing illicit crop cultivation, but they will not provide the most effective solution.

The second fundamental principle is that counternarcotics strategies must lead with state presence and security. There is an overwhelming amount of qualitative and quantitative evidence that asserts this fact. Dion and Russler predict that state presence can reduce the cultivation of illicit crops on its own.⁷⁸ The Thai-German Highlands Development Program illustrates the same relationship.⁷⁹ Catalano determined security issues to be the largest determinant of success or failure within counternarcotic efforts.⁸⁰ As for its role in a coordinated approach, the General Accounting Office, Congressional Research Service, USAID, and UNODC all state that government control is an essential prerequisite for counternarcotics initiatives. State presence and security will have a significant role in any counternarcotics strategy.

While eradication and alternative development require state presence and security, evidence has yet to establish additional requirements on which state presence and security depend. State presence and security may be enhanced through alternative development and eradication, but those components are not required to establish it. Thus, before any other counternarcotics initiatives commence, all effort must be directed towards establishing government control, to include state presence and security. Resources allocated to other counternarcotics components prior to the establishment of government control are wasted.

The third fundamental principle is that eradication reduces illicit crop cultivation when applied with sufficient threat. This is revealed in interviews with Peruvian and

⁷⁸Dion and Russler, 420.

⁷⁹Dirksen, 2.

⁸⁰Catalano, 41.

Colombian coca farmers as well as the analysis of ToE and LIM. The Office of National Drug Control Policy states, “In several interviews with former coca growers in Peru and Colombia, they overwhelmingly reported that the single most important factor in motivating them to move to licit crops was the threat of eradication.”⁸¹ Data that compares the changes in TPIC versus ToE exhibits a LIM. When ToE exceeds that LIM, the resulting TPIC was reduced. This is consistent in data from Colombia, Peru, and Thailand. An examination of econometric analyses predicts that eradication implemented at a ToE less than the LIM will actually increase TPIC. Thus, eradication campaigns need to be conducted with sufficient ToE to exceed the LIM. If this is not possible, then eradication campaigns should not be conducted at all, as they have a higher chance at increasing TPIC rather than reducing illicit crop cultivation.

Currently, the only way to determine the LIM is through historical eradication and illicit crop cultivation data for a targeted area. However, factors that have historically proven to reduce illicit crop cultivation, such as state presence and alternative development, should theoretically lower the tolerance as well. Unfortunately, at this time, there is not a process for predicting the eradication tolerance of an area other than statistical analysis of historical data. When estimating a LIM, it is better to overshoot the ToE rather than undershooting it. Overshooting simply results in the removal of additional illicit crops. Undershooting results in an increase in the cultivation of illicit crops.

If, after estimating the LIM, the total amount of illicit crops increases after the first year of eradication, then the true LIM was not reached and the ToE should be

⁸¹Office of National Drug Control Policy, “Coca in the Andes.”

increased. If the total amount of illicit crops decreases, then the amount of eradication can be reduced by a comparable amount. The ToE, however, should remain the same. If it is believed that the ToE is significantly larger than the LIM, the ToE may be reduced over time as well, though care must be given to ensure it does not drop below the LIM.

The fourth fundamental principle is that alternative development must be applied in the correct sequence, leading with human resources development, local participation, and investment in infrastructure. Though there is insufficient empirical analysis of the sequencing of all alternative development components, certain requirements are substantiated through matching recommendations from reviews of various alternative development projects. Qualitative data, in addition to logic, establishes that successful alternative development projects begin with local participation and human resources development. The timing for investment in infrastructure will depend on these first two steps, but reliable access to licit markets is a prerequisite to crop substitution programs.⁸² Other alternative development components that are applied prior to the establishment of human resources development, local participation, and reliable access to licit markets suffer the same fate as uncoordinated counternarcotics approaches. They may have an effect, but their effectiveness will be reduced and possibly nullified.

A Universal Framework for a Cost-Effective Counternarcotics Strategy

These fundamental principles can be combined to establish a universal framework for the strategic reduction of illicit crop cultivation in source countries. A cost-effective strategy is essential due to the size of the problem and the capital and time intensive

⁸²Felbab-Brown, et al., vii.

requirements of its solution. Resources wasted on inefficiencies in one area reduce the ability to affect other areas.

The first step of a cost-effective counternarcotics strategy is ensuring unity of effort. The first fundamental principle states that counternarcotics strategies require multiple coordinated components. The only way to effectively do this is through a unified effort. This includes the US government agencies, the source country government agencies, implementing partners, and eventually the targeted local community. This unity of effort needs to be established before any other steps are taken.

The second step is determining and defining the targeted area. The area under illicit crop cultivation may exceed the abilities of the source country government and thus the government must target only part of the area. The second principle requires that this area can be secured. The third principle requires that eradication efforts occur at a level that the ToE exceeds the LIM. The fourth principle states that alternative development will require human resources development and most likely an investment in infrastructure. A realistic estimate must be made regarding how much of the area under illicit crop cultivation can be targeted without ignoring any of the four principles. This may be a smaller area than one wants to target, but a larger area will waste money with inefficient strategies. It is better to eliminate illicit crop cultivation in a smaller area and then target a new area.

The third step is to ensure state presence and security within the targeted area. This is the second principle. Unfortunately, there is no information on how to determine a sufficient level of state presence and security. Until more studies have been conducted,

the best method is to conduct interviews to determine if farmers feel safe and whether or not they acknowledge signs of government presence.

The fourth step is to follow security and state presence with human resources development, local participation, and investment in infrastructure. While this commences the beginning of alternative development projects, not all alternative development components should be implemented at this time. Evidence demonstrates that a successful eradication campaign requires alternative development due to the alternative livelihoods available to illicit crop farmers.⁸³ However, human resources development, local participation, and investment in infrastructure must occur prior to improvements in availability of alternative livelihoods. Thus, while coordinated counternarcotics approaches require eradication and alternative development, human resources development, local participation, and investment infrastructure must lead both areas.

The fifth step is to initiate the eradication campaign in conjunction with additional alternative development components. The sequencing of these efforts will be determined in consultation with the local community. As per the third principle, the ToE must exceed the LIM. Also, while evidence demonstrates that alternative development targeting at least 10 percent of the area under illicit crop cultivation can have a drug control impact (table 6), that analysis was done at a national level. Many of the areas only had a positive impact on drug control in the project areas themselves. In a cost-effective, coordinated counternarcotics strategy, alternative development should be provided for 100 percent of the targeted area. Alternative livelihoods reduce the amount of displacement that occurs

⁸³Felbab-Brown, et al., 8; United Nations Office on Drugs and Crime, *Alternative Development*, 14; Dion and Russler, 399.

due to security and eradication.⁸⁴ The reduction in displacement decreases the need to target the same illicit crop farmers in a new area.

The sixth step is to maintain a long-term eradication program. The improvements made to alternative livelihoods in a targeted area do not provide sufficient resistance to illicit crop cultivation alone. In Thailand, a country that was able to reduce opium cultivation by 97 percent, eradication is still required in order to sustain its success. In San Martín, Peru, the location of the “Miracle of San Martín,” a ToE is still required as well. The year that the ToE was reduced from 90 percent to 26 percent resulted in a 30 percent increase in TPIC the following year. Maintaining a ToE over the LIM remains cost-effective, because it continues to reduce the TPIC. As the TPIC is reduced, less eradication is required to sustain a ToE that is higher than the LIM. Insufficient data is available to conclusively determine the changes in the LIM as the TPIC approaches zero, though it suggests that the LIM is substantially increased in this case. At the point that this most likely occurs, however, the TPIC has been reduced to statistically insignificant levels.

Performance Measures

The majority of academic literature analyzing counternarcotics strategies focuses on performance measures for success that are inadequate. Most papers examine, at a minimum, hectares of illicit crop cultivation remaining at the end of a year and hectares of coca eradicated. Some will include the number of drug seizures that occur as a

⁸⁴Felbab-Brown, et al., 28.

measure for interdiction and the sales of licit agriculture for alternative development. These can paint inaccurate pictures of what is occurring.

The changes in the TPIC are a better indicator of the effectiveness of counternarcotics strategies, because it shows whether or not they are reducing the motivation of farmers to plant illicit crops. The ToE is more meaningful than hectares of coca eradicated. Overall eradication in a country could increase, but if the total planted illicit crops increased by a larger amount during the same period of time, then there is actually less ToE. ToE is what actually affects farmers. Interdiction data can be misleading as well, because the more drugs that are transported, the more chance there is of interdiction. Thus higher rates of interdiction may simply signify that a larger amount of illicit drugs are being transported, instead of increased effectiveness of law-enforcement agencies. In this case, increased interdictions would actually be the result of an unsuccessful counternarcotics strategy. As for sales of licit agriculture, Dion and Russler predicted that coca cultivation increases with the licit agriculture output through econometric analysis. Environmental conditions that favor licit agriculture also favor illicit agriculture; thus using licit agricultural sales as a performance measure is also not sufficient.⁸⁵

Additional variables to those regularly collected that would help measure a holistic approach to reducing illicit crop cultivation are: state presence, market access, security presence, total illicit crops planted, and the threat of eradication. Dion and Russler measured state presence through the public administration and community services output divided by the population and market access through paved roads as a

⁸⁵Dion and Russler, 409.

percentage of all roads.⁸⁶ Security presence could be measured by the number of police officers divided by area divided by population. Change in TPIC equals the change in the sum of hectares of eradicated illicit crops and hectares of remaining illicit crop cultivation at the end of the year. The ToE is hectares of eradication divided by hectares of total illicit crops planted. In addition to more effectively monitoring the effectiveness of a counternarcotics strategy, as these variables are regularly collected, better analysis can be performed to determine the key factors in a cost-effective counternarcotics strategy. Issues that could be addressed are: what amount of state presence and security is sufficient to begin human resources development, local participation, and investment in infrastructure; what variables affect the LIM; and how to predict a LIM through demographic variables as opposed to historical data.

Areas for Additional Research

The data in chapter 4 strongly support the premise that farmers have a limit to their tolerance of eradication. However, it does not specify a way to predetermine this limit. This subject that would greatly benefit from an econometric study that kept the limit to farmers' tolerance of eradication as a dependent variable and used the following as independent variables: state presence, security, hectares of land under illicit crop cultivation divided by hectares of land under licit crop cultivation, and size of targeted area. Such a determination would allow a streamlined method for determining the minimum threat of eradication that is required to prevent an increase in illicit crop

⁸⁶Dion and Russler, 409.

cultivation. This would be extremely helpful in the early stages of a counternarcotics campaign.

Another relationship that requires further analysis is the link between government control and successful counternarcotics strategies. Econometric models could quantitatively determine the amount of state presence and security that is required for successful counternarcotics efforts, which would aid in the development of counternarcotics strategies. Further analysis in this area may also provide demographic variables linked to government control.

Quantitative analysis of conditionality, the linking of alternative development to a zero-illicit crops policy, is another area that would refine counternarcotics strategies. The US still defaults to a zero-illicit crops policy when providing alternative development. This is counter to the majority of the rest of the world, to include the United Nations. Felbab-Brown et al. cited the US's zero-illicit crop policy as an obstacle to the reduction of coca cultivation.⁸⁷ Recently, the US has begun pilot programs that relax such rigid standards. As quantitative data become available on the differences in effectiveness of crop substitution programs that require a zero-illicit crops clause and those that do not, this will be an area that will help determine if the US should hold fast to such policies or adopt a stance similar to the UN.

Conclusion

This thesis proves the existence of a universal framework that can be used as a cost-effective counternarcotics strategy to reduce illicit crop cultivation in source

⁸⁷Felbab-Brown, et al., 48.

countries. It does so by providing conclusive evidence for four universal counternarcotics principles:

1. Counternarcotics strategies require multiple coordinated components.
2. Counternarcotics strategies must lead with state presence and security.
3. Eradication reduces illicit crop cultivation when applied with sufficient threat.
4. Alternative development must be applied in the right sequence, leading with human resources development, local participation, and investment in infrastructure.

The existence of multiple universal principles is evidence of a framework that encompasses those principles. There are at least six steps in a universal framework that strategically reduces the cultivation of illicit crops in a cost-effective manner:

1. Ensure unity of effort.
2. Determine and define the targeted area.
3. Ensure state presence and security within the targeted area.
4. Follow security and state presence with human resources development, local participation, and investment in infrastructure.
5. Initiate eradication campaign in conjunction with additional alternative development components.
6. Maintain a long-term eradication program.

This thesis does not assume to have identified all of the universal counternarcotics principles and, in fact, suggests that further research should be pursued in order to obtain more information. Two areas that have been suggested for additional analysis are the determination of the limit to farmers' tolerance of eradication, and the amount of security and state presence that is sufficient for the effectiveness of other counternarcotics

components. As more principles are discovered through additional studies, the current framework will continue to be refined. As the universal framework grows and is refined, it will become even more cost-effective, increasing its ability to strategically reduce the cultivation of illicit crops.

GLOSSARY

Demand-side Reduction: Counternarcotics efforts that target the demand for illicit drugs.

Eradicated Crops (EC): The number of hectares of illicit crops eradicated over the course of a year.

Farm-Gate Price: The amount a farmer is paid for crops.

Harvested Illicit Crops (HIC): The estimated number of hectares successfully cultivated with illicit crops during the year.

Limit to the Tolerance of Eradication (LIM): A numerical value, that when exceeded by the Threat of Eradication (ToE), results in a reduction in the Total Planted Illicit Crops (TPIC) of the following year.

Source Country: A country where illicit crops are cultivated and their product is exported

Supply-side Reduction: Counternarcotics efforts that target the availability of illicit drugs.

Threat of Eradication (ToE): Eradicated Crops (EC) divided by Total Planted Illicit Crops (TPIC).

Total Planted Illicit Crops (TPIC): The sum of Eradicated Crops (EC) and Harvested Illicit Crops (HIC) in the same year.

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